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Intrigue of the Past

INVESTIGATING ARCHAEOLOGY



A curriculum sponsored by the Utah
Interagency Task Force on Cultural Resources

Bureau of Land Management • National Park Service • U.S. Forest Service • State of Utah

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Utah Interagency Task Force on Cultural Resources

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July, 1990

**INTRIGUE OF THE PAST:
INVESTIGATING ARCHAEOLOGY**

REVIEW COPY

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Intrigue of the Past: Investigating Archaeology is a curriculum project sponsored by the Utah Interagency Task Force on Cultural Resources, sub-committee on school education. The Task Force is comprised of the Utah divisions of the Bureau of Land Management, U.S. Forest Service, National Park Service, and the State of Utah; it formed in 1987 to cooperatively address the problem of vandalism to archaeological sites in southeastern Utah.

The curriculum program has been implemented by the Bureau of Land Management and the U.S. Forest Service. Shelley J. Smith, Salt Lake District BLM, directed the project. Ms. Smith, Danielle M. Paterson (Wasatch-Cache National Forest), and Jeanne M. Moe (Utah State Office BLM), prepared the materials in this booklet.

Figures were drafted by Stephen F. Poreda and Arthur Rodgers, volunteers with the Salt Lake District BLM, and Joel Paterson drafted the maps. The program cover was designed by John Nielson, BLM State Office. Stephen Poreda photographed the undamaged rock art panels, and Danielle Paterson photographed the vandalized pictograph panel. David B. Madsen provided the pollen picture and identifications.

Conversations with several people along the way have helped us define the approach and content of the curriculum, and we thank them for their assistance and for sharing their ideas and experiences with us: Daphne Sewing, Utah Division of Wildlife Resources - Project Wild Coordinator; Gene Rogge, Arizona Archaeological Council, Archaeology for the Schools Committee; Nola Lodge, Dale Niederhauser, and Don Kauchak, Department of Education Studies, University of Utah; Dee Dee O'Brien, Utah Museum of Natural History; Wil Numkena, Indian Education Specialist, Utah State Office of Education; Clifford Duncan, Director, Ute Tribal Museum; Boone Colgrove, Social Studies Specialist, Utah State Office of Education; and Paul Enciso, Multi-Cultural Center, Granite School District.

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We dedicate this program to Utah's school children. May Utah's ancient and rich cultural heritage be here for their children.

Shelley Smith
Danielle Paterson
Jeanne Moe

INTRODUCTION TO TEACHERS

The Past...we all feel connected to our personal history, how it has shaped the person we are today, and will condition who we become tomorrow. Our society too has been formed by its history, and its relationship to the land, supporter of all life. The Past offers us a unique perspective on who we are, personally and culturally. For hundreds of generations people have lived in the very places we do, have prospered, failed, and endured. Studying our past gives us a rare chance to examine our place in time and forge links with Utah's human continuum.

Utah's prehistoric past is rich almost beyond belief. Few places in the world evidence such remarkable preservation of previous civilizations, and in Utah the Past is immediate and accessible. Anyone can easily travel in time here; walk along trails worn in slickrock by sandaled Anasazi, or contemplate the meaning of creatures and patterns etched in rock by sure hands millennia ago in the West Desert. Refresh yourself at a desert spring and note by the chipped stone at your feet that you are simply the most recent visitor to a place that has meant survival to incalculable numbers of people. In many places in Utah, you can stand at a prehistoric site and take in a landscape little changed by the centuries. You can see what they saw, and imagine another way of life. You become a richer person for knowing the human history of your home.

The accessibility of Utah's prehistoric sites, however, will soon mean the destruction of our cultural legacy unless we all unite to save the Past. The number of sites that have not been disturbed or looted is dwindling at an alarming rate. Greed and ignorance are robbing us of our heritage, of our opportunity to experience and connect with our past.

An illegal and thriving market in antiquities supports the destruction of sites by looters in search of artifacts. Hikers and tourists collect a few pottery sherds, not knowing that they are walking away with the data archaeologists rely on to study the lifeways of past people. Vandals walk on the fragile walls of ruins or spray-paint their names over rock art panels, ignorant or uncaring of the fact they are desecrating places of great spiritual significance to Native Americans.

State and Federal laws protect sites on public lands, but law enforcement is only part of the solution to saving our past. Education and teachers with a sense of responsibility toward the Past will make the difference as to whether the school children of today will know and experience Utah's ancient cultural legacy as the adults of tomorrow. The situation is that critical - ask any archaeologist or Native American.

Recognizing the key role of education in preserving the Past, The Interagency Task Force on Cultural Resources sponsored the preparation of this curriculum. The land-managing agencies which comprise the Task Force - Bureau of Land Management, U.S. Forest Service, National Park Service, State of Utah - have a great concern for the preservation of sites on lands for which they are stewards in public trust. Their goal in developing this program is simple and straightforward:

To instill in school children an understanding and ethic of appreciation for archaeological resources, in order to gain their future participation in site conservation.

The effectiveness of this program goes only as far as you, the teacher, implement it. We are not asking for a lot of time on your already crowded teaching schedule, nor a large investment in learning a new field of study. We aren't trying to cultivate legions of student archaeologists. Our intention is that every Utah student will be aware that he or she lives in a place with a very special and threatened resource, that the evidence of the Past is fragile, and we all have a responsibility to see to its preservation.

To appreciate the importance of site preservation, students need a basic understanding of how archaeologists study the Past. This curriculum teaches those basic ideas. The lessons require little preparation to teach, and use readily-available materials. Many of them help you teach core curriculum requirements. The study of archaeology can also address some of the concerns of educators today, namely scientific inquiry, problem solving, observation-inference, cooperative learning, and citizenship skills.

Archaeology is an integrative, interdisciplinary field. Archaeologists ask questions rooted in the social sciences, and research those questions using scientific methods. This fusion of the social and physical sciences means that archaeology is an excellent way to teach students to think holistically, to integrate information from different topics.

Perhaps the most attractive aspect of teaching with archaeology is that you already have students' attention and interest. Almost everyone seems to have a curiosity about it...the intrigue of the past. Archaeology is a fun and motivating alternative for teaching core requirements, while at the same time contributing to saving the past for the future.

The curriculum is flexible; it can be used in its entirety, or by selecting lessons from the three units. It is recommended that Unit 1 be taught as a whole. Unit 1 is an introduction to the history curriculum and to scientific inquiry. Unit 2 includes five lessons about Utah's native people, each lesson written to be taught independently of the other lessons. The Unit as a whole,

though, gives students a complete view of Utah's past. Unit 3 is lessons about the methods of archaeology - tree-ring dating, classification, mathematics - and about valuing the past. Since Unit 3 complements and expands topics covered in the rest of the program, it is best to ground students in the basic concepts and issues of archaeology by teaching Unit 1 prior to Unit 3 lessons. We especially ask that you teach the Unit 3 series of rock art lessons (Lessons 8-10), and/or Artifact Ethics (Lesson 11) because they help students draw their knowledge and feelings about the past together. The lessons provide opportunities for values clarification.

Finally, this is a dynamic document. We want and expect it to evolve to better meet your needs. Your feedback and suggestions for improvement are truly needed and wanted to make this program as effective and widely-used as possible. We are interested to hear how you have adapted or expanded these lessons, or if you have developed lessons and activities which might be included in future versions of this booklet. Please contact Shelley Smith, Bureau of Land Management, 2370 South 2300 West, Salt Lake City, Utah 84119 (801-977-4357), or Jeanne Moe (801-539-4286) with your suggestions, questions and comments.

Thank you for your contribution to saving Utah's past!

INTRODUCING THE PAST

UNIT 1 OF

INTRIGUE OF THE PAST: INVESTIGATING ARCHAEOLOGY

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INTRODUCING THE PAST

A Unit for Studying the Past

This unit, consisting of six lessons, is an introduction to the year's history curriculum, and will familiarize students with basic concepts necessary for studying people and the past. Lessons 3 and 6 are also effective introductions to scientific inquiry. Lesson 3 examines observation-inference, and Lesson 6 explores the concept of context and enables students to apply all they have learned in Unit 1. The objectives of this unit are to enable students to:

1. Learn that history and archaeology are two different methods for studying the past;
2. Understand the concepts of culture, chronology, and context, and the human time scale in North America;
3. Study objects as data from which we can infer behavior; and
4. Understand the role everyone can play in preserving fragile and irreplaceable archaeological and historical data.

The Extensions section of each Unit 1 lesson references lessons in Unit 3, Studying and Valuing the Past. Unit 3 activities supplement and expand the basic concepts taught in Unit 1.

The Unit 1 lessons, in summary, are:

Lesson 1 - Discovering the Past - what possible ways do we have to learn about something which has happened? An exploration of history and archaeology shows students two different methods for studying the past. An activity using two historical accounts and archaeological evidence of the Battle of the Little Big Horn illustrates the methods of archaeology and history.

Lesson 2 - Culture Everywhere - the concept of culture is presented. All people address the same basic needs but different cultures have different means of satisfying those needs. As an example of a way to introduce a specific culture to students, a brief overview of Hopi culture is included.

Lesson 3 - Observation-Inference - these skills are taught by first sharpening students' ability to discriminate between observation and inference. Students practice using the skills with the familiar object of a coin, and then play a guessing game using clues about a room's function.

Lesson 4 - The Time of My Life - the essential element of chronology, the order in which events occurred, is explored. Students write an autobiography, and then make a personal timeline depicting significant events in their lives. An activity follows

where their timelines are mixed up and exchanged with another student, who then tries to establish chronological order.

Lesson 5 - Once Upon a Time - the class makes a display timeline to use as a framework for the rest of the year's history curriculum. They practice cooperation and mathematical skills.

Lesson 6 - It's in the Garbage! - this activity integrates the concepts learned in Unit 1, and gives students an opportunity to apply these skills in problem solving. Trash from different places is examined, illustrating how archaeologists study cultures, observe artifacts and make inferences about behavior, establish chronology, and rely on context for information.

DISCOVERING THE PAST Lesson 1 of Unit 1 - Introducing the Past

AGE:	4th - 7th grades
SUBJECTS:	History, Archaeology, Citizenship
SKILLS:	Comparing methods of history and archaeology, comparing and contrasting data
DURATION:	1 class period
CLASS SIZE:	any

Objectives: Students will 1) understand two different methods for studying the past; 2) learn what constitutes archaeological and historical data; and 3) compare and contrast two historical accounts and the archaeological record of the Battle of the Little Bighorn.

Method: The teacher will lead a discussion about how we can learn about the past, distinguishing between the approaches of archaeology and history. Data used by each discipline are discussed. Two written passages about the Battle of the Little Bighorn, and a summary of the archaeological data, are reviewed to illustrate the different approaches to the past.

Materials: Copycat pages for each student or transparency made from copycat pages.

Vocabulary:

archaeology - a method for studying human culture by analyzing material evidence (artifacts and sites).

artifact - any object made or used by people.

culture - the set of learned beliefs, values and behaviors generally shared by members of a society. "The way the members of a group of people think and believe and live, the tools they make, and the way they do things" (Braidwood 1967:30).

data - information, especially information organized for analysis.

evidence - data which are used to prove a point, or which clearly indicate a situation.

history - a chronological narrative of events, based upon written records.

site - a place where something is or was; in archaeology, a site is a location where people carried out an activity, and left some material evidence of the activity.

Background: A basic assumption of the disciplines of history and archaeology is that it is possible to learn about the past. History and archaeology differ in the kinds of questions they ask and in the methods that are used to study the past. History is primarily concerned with events, specific people, and fine-scale processes, such as the Civil War, the rise of the Japanese samurai, and Simon Bolivar's liberation of South American countries.

Archaeology is a subfield of anthropology. Anthropologists study human cultures and how they change, and seek to make general statements about human behavior. Anthropology addresses questions such as: in what ways does a culture change when people who were nomads become village-dwelling farmers? How does a technological invention, such as the automobile, change society? Is the passage through adolescence to adulthood less traumatic in some cultures than others? Archaeology is the way anthropologists have of studying these kinds of questions through time. Archaeology is the laboratory of time, where we can study human cultures over thousands of years, and how those cultures have changed.

Historians rely mainly on written documents to study the past. They examine old courthouse records, newspapers, books, diaries, and letters, for example. Archaeologists study artifacts and sites - the things people used and the places where they used them.

Many people think that archaeologists study only ancient cultures, and that historians study only more recent events, yet historians do study the written records of the ancient Egyptians, which are over 5000 years old, and some archaeologists research the behavior of modern people by studying their garbage. In a nutshell, archaeology is a method of studying the past, even the past of 10 minutes ago, by researching material evidence - the things people used. History is a method of studying the past by researching written records. The term "prehistoric" refers to the time before written records, and "historic" to the time of written records.

For most of the 12,000 years that people have lived in North America, they did not have a writing system that we understand today. In order to study these people, we have no choice but to study the clues they left behind in the form of artifacts and sites. Artifacts and sites are the data about these past people, the evidence of their lifestyle. Thus, archaeology is the only way to learn more about the people who lived here for thousands of years. Archaeology also helps us to fill in the gaps in historical records. For instance, we may know from courthouse records who lived at an early pioneer farm. By studying the site archaeologically, we could learn the kinds of food they ate, how much they raised on the farm, and how much was bought. From that

information, we could infer family size and how it grew or shrank over the years, how much money the family had, and possibly their ethnic origin.

The Battle of the Little Bighorn neatly illustrates both the historical and archaeological approaches to studying the past. Two different historical accounts of the battle are presented, as well as a summary of the material evidence recovered by archaeological methods. The historical accounts are told from two different perspectives; one represents the viewpoint of the Seventh Cavalry, and the other the perspective of the Sioux and Cheyenne Indian people. The archaeological summary provides a different type of information than do the historical accounts.

The two historical accounts exemplify the concept of perspective. How one perceives an event is based on one's culture and experience; people are imperfect and subjective recorders of events. Historians attempting to tell a story as close to the truth as possible will gather as many eyewitness accounts as they can find.

Procedure: Lead a discussion with the students, asking them how they think we can learn about the past. How can we know about something that happened yesterday? Last year? Fifty years ago? Two-hundred years ago? A thousand years ago, before people used a writing system? Some possibilities are: for recent events, personal memory and memories of people who were there, newspaper accounts, television reporting; for earlier events, written documents of the day, stories handed down from people now deceased; and by material evidence left behind by both ancient and recent events. Ask the students to think about the reliability of each of these sources; do they know of events which they remember differently than someone else who was there?

Explain the differences in the methods of historians and archaeologists, and the kinds of questions each discipline asks. Either read aloud the three accounts of the Battle of the Little Bighorn, or have students read them individually from an overhead projection or their own copies.

Discuss how each account reveals different aspects of the same event. For example, the author of each of the historical accounts could not have known the way the other experienced the battle. Major Reno's initial attack on the southern end of the Indian village can be seen in two different ways. The men in Major Reno's companies believed they were attacking hostile problem-causing Indians. They expected to win easily and when the Indians fought back, they were not prepared for it. They panicked and many were killed and wounded. They frantically tried to protect themselves while the Indians relentlessly fired upon them for the rest of the day.

From the other side's perspective, Major Reno was attacking an Indian village - old people, infants, children, women, the sick and infirm - and the warriors were protecting their village, their people, and their land. They fired upon Major Reno's troops to protect their position.

The archaeological account reveals how the Army's method of fighting led to their downfall. They stayed in fixed positions, while the Indians moved all about, surrounding the stationary soldiers. The archeology also proved that the Indians had superior firearms, many of a type which did not need to be reloaded as often as the guns the Army used.

Other discussion points are to identify ways the two historical accounts are alike, and how they are different; and to contrast the archaeological data based on material evidence with the written accounts.

Ask the students if they have studied other historical events which they believe archaeological data could make better understood. Conversely, have them imagine that we only had archaeological data about the Battle of the Little Bighorn. The information we would have about the battle is more general and descriptive than the understanding we have by studying all three accounts. Develop this point to clearly illustrate to the students the different methods and goals of history and archaeology.

Evaluation: Administer the quiz.

Extensions: Black Elk was a boy when the Battle of the Little Bighorn took place. His book, Black Elk Speaks, Being the Life Story of a Holy Man of the Oglala Sioux (as told to John G. Neihardt, 1961, University of Nebraska Press, Lincoln.) is recommended reading for junior high age and older students.

References:

Braidwood, Robert J.

1967 Prehistoric Men. 7th ed. Scott Foresman, Glenview, IL.

Goble, Paul and Dorothy Goble

1969 Red Hawk's Account of Custer's Last Battle. Pantheon Books, New York.

Jordan, Robert Paul

1986 Ghosts on the Little Bighorn. National Geographic December:788-813.

Reusswig, William

1967 A Picture Report of the Custer Fight. Hastings House, New York.

1. Write an A next to the items below which an archaeologist would use, and an H next to the ones an historian would use to study the past.

<u>H</u>	newspapers	<u>A</u>	arrowheads
<u>A</u>	shoes	<u>H</u>	maps
<u>H</u>	information on a computer disk	<u>A</u>	window glass
<u>A, H</u>	photographs	<u>A</u>	pioneer clothing
<u>H</u>	a diary	<u>A</u>	Indian corn
<u>A</u>	broken pottery	<u>A</u>	a Pony Express station
<u>A</u>	charcoal from a hearth	<u>H</u>	old letters
<u>A</u>	bullet cases	<u>H</u>	an interview with someone present at an event

2. List ten things in your bedroom that you think would tell something about you to someone who doesn't know you. Imagine the things on your list to be clues for an archaeologist.

List could include items such as ruffled curtains, posters, collections of dolls or model cars, certain types of clothing, photographs, other artwork, the colors of furnishings, number of beds and dressers, souvenirs.

3. Now write a short paragraph about yourself as your ten items would show you to be to an archaeologist.

The listed items could indicate the student's sex, age, interests, places they have visited, their dreams and hopes, hobbies, amount of allowance, habits, and whether or not they shared their room.

4. Name one reason why it is important that people not dig archaeological sites or take artifacts away with them.

Reasons should include the concept that archaeological sites and artifacts are the evidence of past people, and disturbing sites and collecting artifacts destroys that evidence.

THE BATTLE OF THE LITTLE BIGHORN

The following passages are excerpted from **Ghosts on the Little Bighorn**, by Robert Paul Jordan (National Geographic December 1986:788-813).

Historical Summary

On Sunday, June 25, 1876, George Armstrong Custer looked down on the Little Bighorn valley. Tepees of a huge Indian village stood for miles along the river, largely hidden behind towering bluffs. The encampment was later estimated at 7,000 or more, with great numbers of warriors.

Custer misjudged the Indians' strength and intentions. He divided his regiment. Three companies under Captain Frederick Benteen, about 115 troopers, went on a scouting trip. Major Marcus Reno and some 140 troopers forded the river and attacked the village's southern end. "Out of the choking dust clouds up ahead, bands of feathered fiends appeared like magic, traded bullets with [Reno's] men, wheeled their ponies, and evaporated into the ghostly swirl of battle" (Reusswig 1967). Reno's men panicked, and were scattered. Forty died, 13 were wounded, many were missing.

Benteen returned to find a badly shaken Reno and his shattered remnant scrambling up the heights above the river and frantically digging in with cups, spoons, and knives. Most of the shovels were an hour behind with the packtrain. The Sioux and Cheyenne warriors laid seige to their position until late the next day.

While Reno was being mauled, Custer with about 210 men, had ridden north a few miles out of sight along the ridge. At some point the Sioux and Cheyenne attacked in force (about 2,000 warriors) across the river and up the ravines. They crept closer to the soldiers and surrounded them. In an hour or so Custer and his five companies were annihilated.

Native American Account

Red Hawk remembers: "We were strong then. And we were happy. I remember that our tipis were pitched in seven great circles beside the river where the valley bottom is flat. There were more tipis than could be counted. Our horse herds covered the sloping prairies to the west of the great encampment like cloud shadows. It was not often that the bands gathered because many people in one place frighten away the buffalo and too many horses soon eat off all the grass. I felt proud to see how many and how strong we were" (Goble 1969)

Reno's attack came suddenly at the southern end of the village. "At once the cry went up: 'Soldiers are coming! Horse-soldiers are attacking!' You could hear the cry going from camp to camp down the valley.

In an instant everyone was running in a different direction. It was like an approaching thunderstorm when everyone runs to bring things in out of the rain and to set the tipi-flaps. But this was different, too. 'Hurry! Hurry! Look after the children and helpless ones!' The air was suddenly filled with dust and the sound of shouting and horses neighing. Dogs were running in every direction not knowing where to go. Boys ran to bring in the herds and the chiefs hurried from their tipis to help the frightened ones.

Black Moon and some of the other Hunkpapa warriors were whipping their horse up and down in front of the soldiers and raising a great dust to hide from view the women and children fleeing down the valley. They were brave men" (Goble 1969).

The Indians drove the soldiers across the river and up the hill. Here the soldiers led by Reno and Benteen dug in and the Sioux laid siege to their position until late the next day. Although the Indians could have easily finished the soldiers off, Sitting Bull thought that there had already been enough killing.

Other groups of Sioux and Cheyenne led by Crazy Horse pursued Custer's battalion while the soldiers made five separate stands. They did not stop fighting until all the soldiers lay dead on the hillside.

Archaeological Summary

Several seasons of archaeological fieldwork have been conducted at the battlefield. More than 4,000 artifacts were unearthed and their locations precisely located on large maps. This work was the first time a battlefield had been systematically plotted into a grid to chart a fight's progress.

"The bullets and cartridge cases were most important in helping us see how the battle was fought," [archaeologist] Scott said. "We coded Army ammunition in blue numbers, Indian in red. This showed us how the forces moved against one another. Thanks to the distinctive markings left by each weapon [on bullets and cartridge shells], we could even chart the paths of individuals."

The Seventh Cavalry fought with Springfield single-shot revolvers. Studies showed that more than a third of the 1500 Indians were armed with at least 41 different kinds of firearms. Perhaps 200 carried 16-shot repeating Winchester and Henry rifles.

The archaeological evidence clearly showed that the soldiers were relatively stationary, trying to hold their battle position, while the Indians moved freely about. They fought an offensive battle, which Custer did not expect them to do, and they overran one position after another.

Archaeological evidence explains how Custer lost the Battle of the Little Bighorn. The Sioux and Cheyenne had superior weapons and their method of fighting in small free-moving groups made it possible for them to surround and overtake Custer's soldiers.

1. Write an A next to the items below which an archaeologist would use, and an H next to the ones an historian would use to study the past.

____ newspapers
 ____ shoes
 ____ information on a computer disk
 ____ photographs
 ____ a diary
 ____ broken pottery
 ____ charcoal from a hearth
 ____ bullet cases

____ arrowheads
 ____ maps
 ____ window glass
 ____ pioneer clothing
 ____ Indian corn
 ____ a Pony Express station
 ____ old letters
 ____ an interview with
 someone present at an event

2. List ten things in your bedroom that you think would tell something about you to someone who doesn't know you. Imagine the things on your list to be clues for an archaeologist.

3. Now write a short paragraph about yourself as your ten items show you to be to an archaeologist.

4. Name one reason why it is important that people not dig archaeological sites or take artifacts away with them.

CULTURE EVERYWHERE Lesson 2 of Unit 1 - Introducing the Past

AGE:	4th - 7th grades
SUBJECTS:	Social Studies, Anthropology, Language Arts
SKILLS:	Comparing similarities and differences, discussion, generalization, analysis, writing
DURATION:	1 class period
CLASS SIZE:	any

Objectives: Students will be able to 1) define and give examples of culture 2) appreciate that people everywhere have the same basic needs which are satisfied in culturally-variable ways; and 3) understand that archaeology is a method for learning about past cultures.

Method: The teacher defines the concept of culture, then leads a discussion using examples from different cultures. Students analyze the "culture" of fictitious peoples portrayed in the media, such as creatures from other planets. A lesson extension outlines a way to study a particular culture in depth. As an example of a way to introduce another culture to students, a brief overview of Hopi culture is included.

Materials: Books on anthropology, religion, art, cultural literature, fables, myths, legends, ceremonies, and games; films and music (Resource Guide). National Geographic is a wonderful source of information about people in other cultures.

Vocabulary:

archaeology - a subfield of anthropology; a method for studying human cultures by analyzing material evidence (artifacts and sites).

culture - the set of learned beliefs, values and behaviors generally shared by members of a society. "The way the members of a group of people think and believe and live, the tools they make, and the way they do things" (Braidwood 1967:30).

ethnocentrism - the attitude that one's traditions, customs, language and values are the only right and proper way and that the cultures of other peoples are inadequate or wrong.

Background: Culture is all the learned behavior and beliefs that a person acquires through formal and informal education; it enables a person to be a participating member in their society. Culture

is all around us. It is such a fundamental aspect of being human that it is difficult to describe, like the concept of "soul" is difficult to define. We know what culture is, but what it means is complex to articulate. Perhaps the best method of teaching the concept of culture is by citing examples of what comprises it.

Culture is all of the products of human interaction and thought created by a group of people at a particular time and place. Culture includes language, art, beliefs, religion, customs, traditions, stories, food, housing, clothing and jewelry. It is the way we fix our hair, the way we eat our food; it is what we find funny and what we find sacred.

Culture is dynamic; it is constantly changing. What was fashionable in American culture this year is different from last year, and next year it will be different again. Changes in culture can be seen in the types of tools people use, and in their language (think of slang words like "chill out", and "awesome", the "mellow out" and "groovey" of the 1980s). Styles of clothes, artistic designs used in pottery, and architecture are other examples of cultural elements that noticeably change with time.

The reasons cultures change are very complex and little understood. In fact, the mechanisms and results of culture change are major topics of anthropological research. Sometimes a technological change will cause far-reaching alterations in a culture (see Lesson 5, Unit 2 for a description of how acquiring horses changed the culture of Numic people).

Artifacts can reflect on-going changes in a culture. Think of McDonald's restaurants. In the late 1950s when the business began, restaurants had large conspicuous arches, and no seating. They were strictly drive-up, take-away food restaurants. American culture at the time was being revolutionized by the availability of automobiles to almost everybody, and more people had a larger disposable income than ever before. Eating-out was something affordable, and taking an outing in the car was considered a pleasure. By the late 1980s, McDonald's arches were much reduced or eliminated, as styles that looked more "natural" came into vogue. Inside seating capacity grew from a few stools at a counter to dozens of tables and booths. Driving is now more a means to get somewhere than a source of recreation, and people who fight traffic don't want to eat in their cars, too. Many McDonald's restaurants also have playgrounds, and special "kid's meals". The baby-boomer generation has grown-up, with kids of their own. Today, people eat out much more frequently than in the 1950s, reflecting both more disposable income and less time to shop for and prepare food at home. We can thus see many of the changes in American culture over the past 30 years reflected in the artifact of McDonald's restaurants.

All people everywhere have four basic needs which must be met. What must be satisfied is universally human. How needs are satisfied is cultural. These are:

1. The need for food and water (economics);
2. The need for protection from the elements (clothing and housing);
3. The need to reproduce the culture (marriage, kinship, education); and
4. The need for explanation (religion, philosophy, science).

When studying other cultures, there is a tendency to emphasize the differences among people, and to look at other cultures ethnocentrically. It is important to not accentuate "them" and "us"; a culture is neither better nor worse than another, just different. Cultures with less sophisticated forms of technology are frequently portrayed as simple-minded and naive. On-the-contrary, such people often have unequalled understanding, knowledge and adaptability to the environments in which they live.

Archaeologists study past cultures by analyzing material remains (artifacts and sites). Many people mistake archaeology for a swashbuckling "Indiana Jones" adventure, and archaeologists are thought of as questing after rare and beautiful artifacts. True, at times archaeologists do find rare and beautiful things, but they are more accurately compared to Sherlock Homes, a detective of the past, piecing together the culture of a people. A lone artifact discloses almost nothing about a culture. It is by studying many sites and artifacts, and their relationship to each other and the environment, that reveals the way people lived. Utah author Terry Tempest Williams tells us, "It is not the sandal, but the sandaled foot". Archaeologists study people by studying the things they left behind.

Procedure: Define culture for the students. Ask them to list examples of the different ways people have satisfied the four basic human needs. For example, ask them to list foods of other cultures (Chinese, Mexican, French). Contrast our culture with others, pointing out that the needs are the same everywhere. If different cultures seem strange or inferior to the students, inform them that our culture can be baffling to people from another culture.

Discuss aliens or creatures from other planets and places as the ultimate cultural intrigue. Who are they? What do they look like? Are they like us at all? Do they exhibit the four basic human needs? Why is it dramatic or funny when they encounter our culture?

Evaluation: Assign students to write about the cultural attributes of an alien group which has been portrayed in the media (T.V., movies, comic books). Also have them list several similarities and differences between our culture and theirs. Remember that culture is learned and does not include biological attributes. Examples could include: Alien Nation, Mork and Mindy, Star Trek (Vulcans, Klingons etc.), Alf, Ninja Turtles, E.T., Dune, and Alien.

Alternatively, have them read about another culture and complete the same writing activity.

Extension: Choose one cultural group and study them in depth. Below is an example of how to study a living group. Unit 2 is lessons which could be used to teach about prehistoric cultures. Include as much diversity in the study as you can. The more the students can actually experience, the more meaningful and memorable the learning will be. Music, food, clothing, a visit to a museum, a classroom speaker from another culture, and children's books are wonderful and effective ways to enliven the study of other people.

Try to use resources that are close to the source; i.e. use materials made and prepared by the people you are studying. When studying Indian cultures, consult American Indians of Utah: A Guide for Teachers. This is an annotated guide to educational materials about Native peoples, published by the Utah State Board of Education, Indian Advisory Committee.

Finally, do not single out or make an example of students in your classroom who are from minority ethnic groups. The attention can be embarrassing and hurtful. However, welcome what these students might freely offer to the study of other cultures.

The Hopi Indians of Northern Arizona

Hopi - Descendants of the Anasazi

The Hopi people of Northern Arizona recognize themselves as descendants of the Anasazi Indians. "Hopi" means "peaceful people". The Anasazi lived in the Four-corners region from about 500 B.C. to A.D. 1300, when they abandoned their cliff dwelling homes and moved southward to the Rio Grande River drainage and the Hopi Mesas (Lesson 4, Unit 2). We are not sure why they uprooted themselves and moved away.

Modern Hopi people retain many cultural characteristics that are seen in the archaeological record of the Anasazi. For example, the Hopi live in adobe structures on top of mesas and build round ceremonial structures called kivas. The Anasazi made their homes out of adobe and also built kivas. The Hopi are masters of dry farming, (growing food without extensive irrigation) and they cultivated corn, beans and squash. These foods were also grown by the Anasazi in much the same way.

Corn - A Way of Life for the Hopi

Corn is one of the most sacred aspects of Hopi culture. Traditionally, Hopi people's survival depended on corn. Pollination and moisture are essential for the growth of this lifeblood food, and pollen and rain are very sacred to the Hopi. They grow four different colors of corn - blue, white, yellow and red - representing the four cardinal directions. Blessings, dances and ceremonies are offered to corn, and it is eaten with almost every meal. A Hopi baby is named during a ceremony in which he or she is given their first taste of corn mush.

Hopis make a special food of corn called Piki Bread. It is made for all special occasions and for ceremonies. "In every house there is a little oven made of a flat stone eighteen or twenty inches square, raised four or five inches from the floor, and beneath this a little fire is built. When the oven is hot and the dough is mixed in a little vessel of pottery, the good woman plunges her hand in the mixture and rapidly smears the broad surface of the furnace rock with a thin coating of the paste. In a few moments the film of the batter is baked; when taken up it looks like a sheet of paper. This she folds and places on a tray. Having made several sheets of this bread from the batter of one color and placed them on the tray, she takes the batter of another color and, in this way makes seven sheets of each of the several colors of corn batter" (Powell 1972:20).

A traditional recipe for Piki Bread:

- 1 cup green juniper ash
- 1 cup boiling water
- 3 cups water
- 1 cup blue cornmeal
- Sunflower oil for greasing stone

Mix ash with boiling water. Strain juniper ash into a pot. Stir. Add blue cornmeal and water. Stir with a wooden spoon or stick. Let cool. Spread on hot, greased griddle or stone with palm of hand. Be certain the layer is very thin. Cook for a very short time. Carefully, lift paper-thin layer from the griddle by rolling from one end to the other, jelly roll fashion. (Williamson and Railsback 1987:46-47)

Blue corn and pinyon pine nuts are two Hopi foods. Students can try blue corn chips, blue popcorn, or pinyon pine nuts as examples of Hopi foods.

Hopi Kachinas

Kachinas are central to the Hopi religion, and are rooted deep in ancient Anasazi culture. "Kachina can mean three things: the spirit the Hopi believe in, a masked dancer which embodies the kachina spirit, and a carved doll, painted in the spirit's likeness. Kachinas can take many forms --demons, ogres, animals, birds, or clowns. Mudheads are the best known Hopi clowns" (Billard 1974:181).

Hopi's believe that the kachina spirits live with them for six months of the year. At the end of their stay, the kachina spirits are sent back to their home on the San Francisco Peaks with a grand ceremony called the Niman or "home" dance. "It is on these peaks where the kachinas are believed to feast on plump squash and melons and gather their ceremonial needs for six more months of the year. A Hopi with a pure heart may someday join his ancestors on the snowy peaks" (Billard 1974:179).

A Hopi Kachina Song

"In May, corn planting time, the Kachinas wear masks painted with rainbows, and they sing a song about butterflies flying over the corn and bean fields. One butterfly is flying after another, like a hunt, and there are many butterfly pairs. Even as the Hopis paint their faces for a ceremonial dance, so have the butterflies painted themselves with pollen for their flight over the corn blossoms. The butterflies must go through many flowers, say the Hopi, to make themselves so pretty" (Williamson and Railsback, 1987:47).

Korosta Kachina Song

Yellow Butterflies,
Over the Blossoming Virgin Corn,
With Pollen-Painted Faces
Chase One Another
In Brilliant Throng

Blue Butterflies,
Over the Blooming Virgin Beans,
With Pollen Painted Faces
Chase one another in Brilliant Streams.

Over the Blooming Corn,
Over the Virgin Corn,
Wild Bees Hum.

Over the Blooming Virgin Beans,
Over the Virgin Corn,
Wild Bees Hum.

Over the Field of Growing Corn,
All Day Shall Hang the Thunder Cloud;

Over Your Field of Growing Corn
All Day Shall Come the Rushing Rain.

Hopi Households

The Hopi are a matrilineal society, which means that the family lineage is traced through the mother's side of the family. By Hopi custom the bridegroom does not take his bride away with him to his village, but comes to her home or neighborhood. In Hopi view, the mother is the real head of the family lineage. "Children may look to their fathers, but their mother's brother holds a blood relationship which gives him an authority greater than the father" (O'Kane 1974: 50). Women are traditionally the decision makers and the disciplinarians of children. The mother's brothers also have an important role in helping raise the children.

A household, as a Hopi defines the term, comprises all the blood relatives, near and remote, and links with other households that trace back to a common origin. This extended group makes up a Hopi clan. "A clan is comprised of several families, the members of each family being related through matrilineal descent and taking the clan name of the mother. The name and functions of the family are of little importance. It is the clan that counts, determining the standing of the individual in both religious and secular matters. Some of the most prominent clans include the Bear, Parrot, Eagle, and Badger clans. Each of these clans represents the four

directions from which the Hopi believe they arrived at the present Hopi mesas from four separate migrations" (Waters 1978:20).

Hopi Ways

John Wesley Powell, an early explorer and scientist, visited the Hopi Mesas in 1870. He observed:

In the early history of this country, before the advent of the Spaniards, these people raised cotton, and from it made their clothing; but between the years 1540 and 1600 they were supplied with sheep, and now the greater part of their clothing is made of wool, though all their priestly habiliments, their wedding and burying garments, are still made of cotton.

Men wear moccasins, leggings, shirts and blankets; the women, moccasins, with long tops, short petticoats dyed black, sometimes with a red boarder below, and a small blanket or shawl thrown over the body so as to pass over the right shoulder and under the left arm. A long girdle of many bright colors is wound around the waist. The outer garment is also black. The women have beautiful, black glossy hair, which they take great pains in dressing. Early in the morning, immediately after breakfast, if the weather is pleasant, the women all repair to the tops of the house, taking with them little vases of water, and wash, comb, and braid one another's hair. It is washed in a decoction of the soap plant, a species of yucca, and then allowed to dry in the open air. The married ladies have their hair braided and rolled in a knot at the back of the head, but the maidens have it parted along the middle line above, and each lock carefully braided, or twisted and rolled into a coil supported by little wooden pins so as to cover each ear, giving them a very fantastic appearance.

I have already said that the people are hospitable; they are also very polite. If you meet them out in their fields, they salute you with a greeting which seems to mean "May the birds sing happy songs in your fields." They have many other greetings for special occasions. Do one a favor and he thanks you; if a man, he says, "Kwa kwa;" if a woman, "Es-ka-li." And this leads me to say that there is a very interesting feature in their language... many words are exclusively used by men, other by women. "Father," as spoken by a girl, is one word; spoken by a boy it is another; and nothing is more vulgar than a man to use a woman's word, or a woman a man's (Powell 1972:21-22).

A Hopi Origin Myth

The Hopi believe that the first people originated underground and emerged through a hole they call a sipapu. Sipapus are a feature in Hopi kivas and are also found in Anasazi kivas. The sipapu is a small hole in the kiva floor, and is always located behind the fire pit on the north side of the kiva.

As told by Reynold Nash, a Hopi boy:

The Hopi people came up from a hole in the ground. When they die, they go back into the hole to another world.

The first world of the Hopi Indians was a bad place. The god who made the world said he would make a second world. He told Spider Woman that she should lead the people to a second world.

She showed them the way and when they got there they started planting and building homes but things were not good. There was a lot of killing going on and there was no game to hunt.

Spider Woman went to the god and told him what was happening. He said he would make a third world and that Spider Woman would lead the people again.

In the third world there was no killing and for a while there was enough game. The people tried to plant food but the plants could not grow because there was no light or heat.

The god told Spider Woman to build bonfires around the field. The fire gave some heat and light and the people built fires every day. That way they were able to make things grow. But still that dark world was not good. People were dying. Again Spider Woman went to tell the god what was happening.

He said he would make the fourth world. It would be the last one he was going to make, he said.

The Hopi people came up into the light. They found good land to plant.

They lived high up on the mesas where they were safe from their enemies, the Navajos and Utes and other tribes.

Now there are roads leading up to the thirteen Hopi villages, the same roads that used to be trails made by the first Hopis. The Hopis still have the same shrines their ancestors had.

The Hopi people have a good life. They grow their crops in peace. The men make kachina dolls out of cottonwood and the women make baskets out of yucca and pottery out of clay.

The Hopis are still in the fourth world. They thank the god and Spider Woman by taking prayer feathers to the shrines.

The Hopis enjoy staying in the fourth world." (Baylor 1976:26-28).

The Hopi Today

Many Hopi people retain much of their traditional culture. They are exquisite potters, basketmakers, carvers, weavers, and silversmiths. Many Hopi still live by their old traditions and ways, while others adopt aspects of modern culture. Like many American Indian tribes, the Hopi confront problems living in two cultures. Issues surrounding land use, energy and mineral development, and social and health problems are all dilemmas the Hopi continue to deal with.

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OBSERVATION - INFERENCE Lesson 3 of Unit 1 - Introducing the Past

AGE:	4th - 7th Grades
SUBJECTS:	History, Anthropology, Science, Citizenship
SKILLS:	Observation-inference, scientific inquiry, problem-solving, cooperative learning
DURATION:	1 class period
CLASS SIZE:	any, work groups of 5-6 students

Objectives: Students will be able to 1) tell the difference between observations and inferences; 2) experience how archaeologists infer the behavior of past people by observing artifacts; and 3) explain why artifacts and archaeological sites must be left undisturbed if we are to learn more about the past.

Method: The teacher explains the difference between an observation and an inference, clarifying that observation-inference is the basis for all sciences. Two activities follow where students practice distinguishing between observation and inference. Finally, students play a game using observations about artifacts to infer behavior, as an archaeologist does. A discussion of the need for everyone's help with archaeological and historical site preservation concludes the activity.

Materials: Copycat pages for each student or transparencies made from copycat pages; an index card and a pencil for each student.

Vocabulary:

artifact - any object made or used by humans.

inference - a conclusion derived from observations or premises.

observation - recognizing or noting a fact or occurrence.

Background: Archaeologists use observation-inference to recreate the story of past people. By making observations about objects (artifacts and sites) we infer the behavior of the people who used the objects. Observation-inference is a skill we all use in everyday life; we observe that the dog is not on his chain and there's a hole dug under the fence. We infer that the dog dug the hole and escaped. Archaeologists infer that obsidian (volcanic glass used to make sharp tools) from Oregon discovered at a site in Utah means that prehistoric people were trading with one another. We have all had the experience of making an incorrect inference. Archaeologists construct careful hypotheses and examine

alternatives when making inferences from archaeological data, and they apply rules of evidence for interpreting the data.

The data archaeologists rely upon to tell the story of past people is disappearing at a rapid rate. The places where many ancient villages were built in Utah are also the places where we live today. Construction of new homes, highways, and shopping malls destroys sites. Often, data from these sites are recovered before they are destroyed, so we have some record of these chapters of the past. Another major source of site destruction is people digging in ruins and collecting artifacts, such as arrowheads and old bottles. They take data about the past home with them, and then archaeologists can never learn the whole story to tell the rest of us about Utah's past.

Everyone can help save the clues from the past by never collecting artifacts or digging in sites. Don't encourage other people to destroy evidence about the past by buying artifacts from them. Severe penalties exist for damaging sites or collecting artifacts - up to \$250,000 in fines and 2 years in jail for the first offense, under the Archaeological Resources Protection Act.

Procedure: Discuss observation-inference with the students, asking them for examples of behavior which they infer from material evidence, and of times when they have made the wrong inference.

Project the copycat page of the boy in the water. Read each statement on the accompanying sheet, asking if it is an observation or inference. Be sure the students understand the difference between the two.

Next, either project the copycat page showing the coin, or give each student a copy. Tell the students that the coin was found by an archaeologist at a site. Which statements are inferences and which are observations? Have students identify the observation each inference is based on. Are the listed inferences the only possible interpretations? In what other ways could the coin be interpreted? If we were to use a United States coin, could we make the same kinds of inferences? Clearly, many different inferences are possible from one observation.

Clarify to the students that science is based on observation and inference. Scientists structure their research to test hypotheses, their proposed explanations. Repeated testing of an hypothesis enables more precise explanations of what has been observed. Any phenomenon being studied must first be observed, whether it be from a satellite or through a microscope. An inference is the proposed reason for an observation. For example, if all the students who ate in the cafeteria were ill the next day, one inference might be that they had gotten food poisoning from the cafeteria food. Since it is possible to make many inferences about an observation, it is

important to distinguish between what is an observation, what is a proposed reason (inference), and what is a tested inference (hypothesis). The poor sick students may have actually transmitted a highly communicable disease to each other, and only testing of the food and medical examination of the students would determine the cause of their illness. Ask students for examples of observations and inferences made by scientists, such as botanists, chemists, astronomers, medical doctors, and biologists.

Next examine with the students how an archaeologist scientifically studies the past. Archaeologists observe artifacts and sites, and infer the behavior of the people who left them. If people have taken artifacts and dug up the site, the archaeologist has had some clues stolen, and cannot make a complete observation. Therefore, he or she cannot make a good inference about the people who lived there long ago, and part of the story of the past has been lost.

Tell the students they are going to play a game, thinking like archaeologists. Divide the class into groups of 5-6 students, and assign each group a different number. Give each student an index card and pencil. As a group, they are to choose a place with a specialized function, such as a hospital operating room, a church sanctuary, a kitchen, a hardware store. They are to decide what items are present in the room that make it distinctive, and then each student writes one clue on his or her card, for a total of 5 to 6 clues per group. Each card also has the group number written on its other side. The stack of cards from each group is passed to the next group, until every group has seen each stack and tried to guess the room's function. The teacher reviews each stack for the whole class, asking how many groups correctly guessed the room's function.

Students can play another round of this game, making it more challenging by including two less clues this time.

In conclusion, the teacher asks the students if the game was more difficult or if mistakes were more likely with fewer clues. Connect the lesson with archaeological data, and how the story of the past cannot be known correctly if people vandalize sites by digging or collecting artifacts. They remove clues, and inferences cannot correctly be made. Discuss what each person can do to help prevent vandalism.

Evaluation: Observe students during class discussions and the guessing game to determine if they can distinguish between an observation and an inference.

Extension: Classification and Observation-Inference, Lesson 1, Unit 3, expands the points covered in this lesson.

Place an 'I' before the statements that are inferences, and an 'O' before the statements that are observations.

O The boy is in the water.

I The weather is cold.

O The tree branch is broken.

I If the boy crawled out of the water the goat would butt him.

I The boy fell off the branch.

O A goat is standing by the pond.

I The branch will fall on the boy's head.

I The boy fell off the rocks.

O There is a sailboat in the water.

I The sailboat belongs to the boy.

I The goat will soon leave the pond.

O The tree by the pond has no leaves on it.

O There are three rocks in the pond.

I The tree by the pond is dead.

I If it rains leaves will grow on the tree.

I The goat butted the boy into the pond.

BOY IN THE WATER

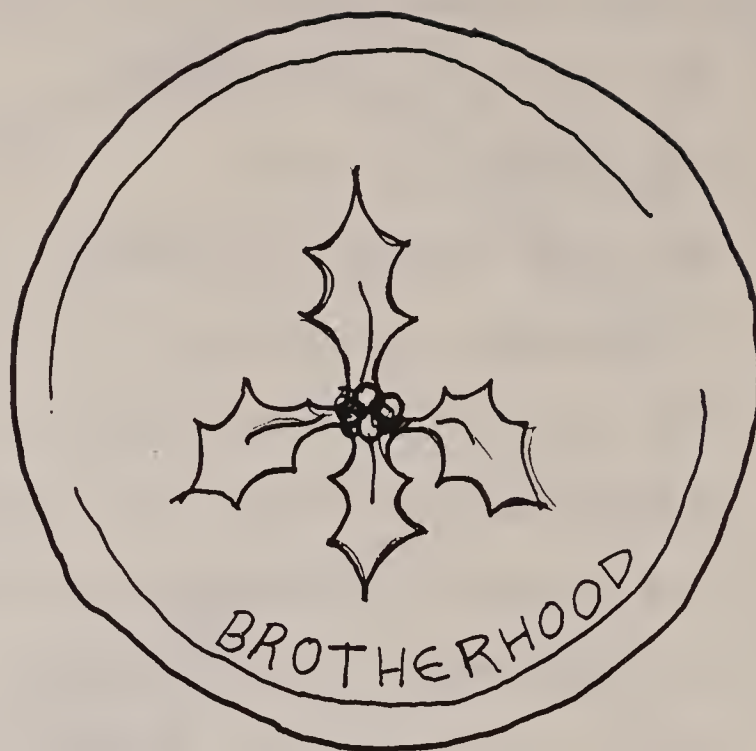


Boy in the Water, page 2

Place an 'I' before the statements that are inferences, and an 'O' before the statements that are observations.

- _____ The boy is in the water.
- _____ The weather is cold.
- _____ The tree branch is broken.
- _____ If the boy crawled out of the water the goat would butt him.
- _____ The boy fell off the branch.
- _____ A goat is standing by the pond.
- _____ The branch will fall on the boy's head.
- _____ The boy fell off the rocks.
- _____ There is a sailboat in the water.
- _____ The sailboat belongs to the boy.
- _____ The goat will soon leave the pond.
- _____ The tree by the pond has no leaves on it.
- _____ There are three rocks in the pond.
- _____ The tree by the pond is dead.
- _____ If it rains leaves will grow on the tree.
- _____ The goat butted the boy into the pond.

Answer sheet



Place an 'I' before the statements that are inferences, and an 'O' before the statements that are observations.

- ☐ 1. There is a representation of a face on one side of the coin.
- ☒ 2. The coin tells us that these were deeply religious people.
- ☐ 3. The words "We Trust the Gods" are printed on the coin.
- ☐ 4. On one side of the artifact is a drawing of leaves.
- ☒ 5. We can tell from the artifact that these were peace loving people.
- ☒ 6. The face on the coin is a representation of the nation's king.

THE TIME OF MY LIFE Lesson 4 of Unit 1 - Introducing the Past

AGE:	4th - 7th grades
SUBJECTS:	History, Archaeology, Citizenship, Language Arts, Math, Art
SKILLS:	Analysis, writing, problem-solving, cooperative learning
DURATION:	1 class period
CLASS SIZE:	any, work groups of 2 students

Objectives: Students will be able to 1) state why it is essential to establish chronological order when studying the past; 2) demonstrate the importance of chronology in their own lives; and 3) appreciate that archaeological sites must be preserved intact so that the chronology of the past can be discerned.

Method: The teacher leads a discussion about chronological order and its fundamental importance in studying the past. Students make a personal timeline, which can be based on their autobiography. They rearrange the order of the timeline, and exchange it with another student. The students then attempt to make sense from the scrambled timelines. The teacher concludes the lesson by showing the necessity of preserving archaeological sites so that chronology can be established.

Materials: colored paper, pencils, scissors, glue, ruler.

Vocabulary:

absolute dating - determining the calendar date of an event, or an approximation thereof.

chronology - an arrangement of events in the order in which they occurred.

relative dating - determining the relationship an event has to other events (before or after), but not knowing the calendar year of that event.

stratigraphy - the layering of deposits in archaeological sites. Cultural remains and natural sediments become buried over time; the layer on the bottom is the oldest, the layer on top is youngest.

timeline - a visual representation of events in chronological order.

Background: The proper sequence of events must be known when trying to understand the past. Chronological order means that events are arranged in the order of occurrence, establishing a chronology. One way to visually display events in chronological order is with a timeline. A timeline is divided into equal time segments (month, year, century, for example), with one end representing the oldest events and the other end the most recent events.

Chronology is something we all use everyday. When somebody tells us a story or when we watch a news report, it only makes sense if we can understand the story as it happened. Historians and archaeologists always try to establish the age of the sites, artifacts, or events they are studying, so they can place them in chronological order. Each piece of information contributes some understanding to the overall story of the past, but only if the information can be placed in chronological order.

Archaeologists have two methods of placing events, sites, and artifacts in chronological order. Relative dating can order things relative to each other, but not anchored to a calendar. Think of a trash can; items on the bottom were placed there prior to the items on the top. Relative to each other, the items on the bottom represent older actions than those on the top. We don't know what day or what year the trash can was filled.

Absolute dating can establish a calendar year for an artifact, site or event, and archaeologists have several methods to learn an absolute date. Tree-ring dating can be very precise, whereas Carbon-14 dating provides a range of possible dates, i.e. A.D. 500 \pm 30, means the date is between A.D. 470 and A.D. 530. To return to the trash can example, if something in the garbage had a date on it, like a newspaper or a postmarked envelope, then we could propose that the garbage in the same layer with it is also that old, and we know an exact date for its disposal.

Archaeological data is often buried. Sites become buried through small-grained particles being deposited by wind, gravity, and water. When archaeologists dig a site, they record the location of what they find, so that chronological order can be established. Objects discovered at the bottom of pits dug by archaeologists are the oldest, while those near the surface are the youngest. Stratigraphic ordering provides relative dating. Some materials discovered at a site can also be dated absolutely.

When vandals and artifact-seekers dig a site, they do not record locations of objects and chronological order cannot be established. They shovel all the dirt together, it is mixed up, and we cannot learn the site's chronological placement. A page of the past has been torn up and thrown away, destroyed. Everyone can help stop this problem by not digging in sites or collecting artifacts, and by not buying artifacts from people who do dig and destroy sites.

Procedure: This teacher has the option of first having each student write his or her autobiography. The teacher should provide a framework and page limit, depending upon the desired extent of the activity. Alternatively, students do not write an autobiography, but begin this activity with the next step.

The teacher defines chronology and the necessity of establishing chronological order when studying the past. The students have demonstrated their understanding of this principle if they have written autobiographies. Have the students reread their autobiographies and extract and list ten or twelve significant events in their lives, or have them make a list of these events if they haven't written autobiographies. These events should not have obvious time links, such as "my eighth birthday party", or "I started 4th grade". The events could be things like "my sister was born", "the family moved", "my cat died", "we went to Yellowstone on vacation", "I had a fantastic dream". Students should try to include events from their entire lives.

Each student is given two sheets of colored construction paper. One forms a backing upon which the timeline is constructed. Leave an inch at the top of the backing sheet for a title, such as "The Life of Jane Doe". Cut out a strip of the other colored paper about 2" wide and glue it to the backing sheet vertically under the heading, along the left edge.

The students list their significant events on the remainder of the second sheet of paper, horizontally, in pencil or crayon. They cut the listed events into separate strips, and scramble their order. Students then exchange their strips with another student, who tries to figure out the correct chronological order. Give the students 10 minutes to do this.

The two students who have exchanged timelines then tell each other their best guess of the proper chronological order of their lives. This should be a humorous experience for the students. The strips are returned to their owners.

The students glue their own strips in chronological order on their backing paper, and write the year of the event on the strip of colored paper glued along the left of the backing.

The teacher discusses the difficulty of getting a story correct when the order of events is not known. Ask the students to imagine the timeline activity with several of the event strips missing. How much harder would it be to make sense of their friend's life and how much information about their life is lost?

As another discussion topic, ask the students which clues they used to arrange some events in relative order. Obviously, a sibling's birth within the limits of the student's lifetime means that the

sibling is younger, for example. Or, students may know some events in their classmate's lives well enough to put them in proper order.

The teacher concludes by stressing how archaeological data is usually impossible to place in chronological order if vandals have dug up a site (like mixing-up the event strips) or if people have removed artifacts (equivalent to removing some of the event strips). Emphasize what everyone can do to preserve sites.

Evaluation: Administer the accompanying quiz.

Extension: Archaeology and Tree-ring Dating (Lesson 2, Unit 3) demonstrates an absolute dating method.

backing
paper →

The Life of Jane Doe	
1990	Event.....
1989	Event.....
1988	Event.....
1987	
1986	
1985	
1984	
1983	
1982	
1981	
1980	
1979	

1) Write a short paragraph about how you would feel if your timeline was all that would ever be known of you, and somebody tore part of it up.

Students should express regret, or a feeling of being upset. For someone to wantonly destroy the only evidence of another's life indicates that they have little respect for the meaning of that person's life.

2) How do you think an archaeologist feels when she or he visits a site that has been dug up by vandals?

By extension of the previous question, students should link their feelings about destruction of their timeline to destruction of evidence of past peoples' lives.

3) Which of the following are statements expressing a relative date and which are statements expressing an absolute date? Write R for relative dating, and A for absolute dating.

R My brother is older than I am.

A I was born in 1980.

R There is a drawer of photographs, and the ones on top are the newest ones.

A This magazine was printed in July of 1987.

R We throw out our garbage everyday, so the oldest garbage is on the bottom of the trash can.

A We throw out our garbage everyday, so the garbage on top is from today.

1) Write a short paragraph about how you would feel if your timeline was all that would ever be known of you, and somebody tore part of it up.

2) How do you think an archaeologist feels when she or he visits a site that has been dug up by vandals?

3) Which of the following are statements expressing a relative date and which are statements expressing an absolute date? Write R for relative dating, and A for absolute dating.

___ My brother is older than I am.

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___ There is a drawer of photographs, and the ones on top are the newest ones.

___ This magazine was printed in July of 1987.

___ We throw out our garbage everyday, so the oldest garbage is on the bottom of the trash can.

___ We throw out our garbage everyday, so the garbage on top is from today.

AGE:	4th - 7th grades
SUBJECTS:	History, Archaeology, Art, Math
SKILLS:	Problem-solving, cooperative learning, illustration
DURATION:	1 class period to construct timeline, group work throughout year to complete.
CLASS SIZE:	any, work groups of 5-6 students

Objectives: Students will 1) comprehend the time scale of human occupation in Utah; and 2) apply mathematics to cooperatively layout a classroom timeline display.

Method: The teacher will review the concepts of chronology and timelines from the previous lesson. The class designs and creates a timeline that will be in the classroom the whole year as a visual display of historic and prehistoric lifeways and events. Each time period is illustrated on the timeline, with one group of students being responsible for each time period.

Materials: One roll of white butcher paper, crayons or markers, tape measure or yardstick.

Background: It is difficult for most people to comprehend that people have been living in Utah for nearly 12,000 years. Such a great timespan is a challenge to imagine, and is problematic to teach. Another challenging concept to teach is the relationship of events to each other, and to the history of other parts of the world. A timeline is a very effective means to visually display a sequence of events, and to show proportionally the duration of time periods. For example, the Mesa Verde Anasazi built, occupied, and abandoned all of the impressive cliff dwelling villages in a period of 125 years, yet their culture endured for over 2000 years. By visually displaying these time periods, a more accurate perspective on the cliff-dwelling Anasazi is possible.

Students will retain information about the past more readily with the use of a timeline, since it reinforces visually what they have heard and read. Also, the difficult concept of time is more easily understood by using a timeline and grounding the student first in time periods she/he can relate to, i.e. their own lifespan.

Procedure: Begin by asking the student to imagine the feeling of being ten years old - the many memories and experiences they have already accumulated. If one was 100 years old, it would be like living one's life ten times over; a thousand years is equivalent to 100 ten year periods.

Tell the students that the class is going to make a timeline to display throughout the year which will help them learn about the past. They or the teacher need to choose a location for the timeline that is high enough for everyone to see. Students measure the length of the available display space, and calculate how large each increment of time needs to be so that 12,000 years can be shown. Either the metric or English measuring system can be used, although most scientists use the metric system. We recommend about 35 cm. (about one foot) be allowed for every thousand years, but one meter per thousand years allows for more illustrations. Draw a prominent line along the length of the paper, about six inches from the bottom. Vertical tick marks are drawn down from this line and periodically labeled to increment the timeline. For example, small tick marks can be made for every 100 years, with larger or different colored tick marks for every thousand years. Students figure out how far apart the tick lines are to be, and take turns labeling a section of the timeline.

Students should decide on some catchy title for the timeline, and apply mathematics to center the heading. As an art extension, they may want to each contribute an element of a border design depicting what time or study of the past means to them.

As students study history and prehistory throughout the year, the timeline is filled in with illustrations of the events and lifeways they are learning about. Students can be divided into groups of 4-6, each group being assigned a block of time for which they are responsible for illustrating on the timeline. The illustrations can be drawings or paintings on the timeline, or collages glued onto it. Written labels are necessary, but should be reinforced with visual depictions, to keep it lively and interesting. Some examples of illustrations for Utah's prehistoric past include representations of houses, tools, types of food, and clothing. Use the history text as a basis for illustrations of historic lifeways and events. Include modern inventions (automobile, computers, video games), and events (World Wars, moon landing, parents' births, founding of their town).

The timeline can be adapted to whatever the history curriculum is for that grade. For instance, when studying Utah history, it is appropriate to begin with Utah prehistory as known archaeologically (see Unit 2, Utah's First People). Since many more events are known from the recent past, (approximately the past 200 years), that portion of the timeline will need to be expanded to a larger scale so that more events can be shown. This is an opportunity to discuss the concept of scale.

When the course of study is the history of another part of the world, Utah's past can be shown in abbreviated form along one strip of the timeline, parallel to events shown from the region of study. This approach helps students to integrate the information they are learning into a comprehensive whole, and to appreciate the patterns

of development in different places at different times. It also facilitates their ability to see whole cultural developmental sequences, instead of unarticulated pieces of information.

Periodically, the teacher should refer to Lesson 1 of this unit, and point out how the timeline is highlighting the difference in the amount of detail an historical approach can provide, versus the more general view of the past gleaned from an archaeological approach.

ITS IN THE GARBAGE! Lesson 6 of Unit 1 - Introducing the Past

Adapted from Garbage Can Archaeology, by E. Charles Adams, Arizona State Museum and Barbara Gronemann, Southwest Learning Sources.

AGE:	4th - 7th Grades
SUBJECTS:	Social Studies, Science, Archaeology
SKILLS:	Analysis, application, classification, comparing similarities and differences, inference, discussion, and generalization
DURATION:	1 class period
CLASS SIZE:	any, work groups of 4-5 students

Objectives: Students will be able to: 1) observe and compare garbage from different places; 2) infer its sources and something about the behavior of the people who threw it away; 3) demonstrate that they understand the concepts of culture, context, and chronology; and 4) relate their study of garbage to the methods of archaeology.

Method: The teacher reviews concepts learned in Unit 1, including the methods of archaeology and history, culture, observation-inference, and chronology. Students work in groups and examine the contents of a wastebasket from an unknown source. They make inferences about human behavior based on their study, and write a short report.

Materials: Filled wastebaskets from several places in the school, home or elsewhere, selected to represent rooms of different function; plastic tarps if garbage is wet.

Vocabulary:

archaeology - a method for studying human culture by analyzing material evidence (artifacts and sites).

artifact - any object made or used by people.

chronology - an arrangement of events in the order in which they occurred.

context - the relationship artifacts have to each other and the situation in which they are found.

culture - the set of learned beliefs, values and behaviors generally shared by members of a society.

evidence - data which are used to prove a point, or which clearly indicate a situation.

history - a chronological narrative of events, based upon written records.

inference - a conclusion derived from observations or premises.

midden - an area used for trash disposal.

Background: The famous anthropologist Franz Boas reportedly said "man never lies to his garbage heap". The unusable or unwanted remnants of everyday life end up in the garbage. By studying what people have thrown away, archaeologists can learn a great deal about a culture. This is true of prehistoric peoples who left no written record about their lives, and of people today. Bill Rathje, an archaeologist living in Tucson, has been studying the garbage of his city for many years. He has learned a great deal about the relationships of human behavior and trash disposal, information useful in studying people of the past and the present. He has found that people will often tell an interviewer what they believe is appropriate behavior, but their garbage tells another story. People frequently say they eat lots of fruit and vegetables, yet their garbage shows they do not. Another example is that people say they recycle more than they actually do (Rathje 1984:27).

Just as we do not throw our trash any old place, prehistoric people didn't either. Their garbage heaps are called middens, and are a rich source of archaeological information about their lifeways. Layers of trash also tell a story over time. The layer on the bottom was put there first, the layer on the top is the most recent. Archaeologists excavate middens slowly and carefully, recording the location of each artifact and sample recovered from the midden. They analyze the tiny fragments of prehistoric meals - bone slivers, seed hulls, plant parts - and charcoal from cooking fires. The animals and plants and trees these remains came from can be identified with the aid of a microscope, and we can learn very precise information about the economy of past people.

Middens also contain information about past climates. Pollen grains from nearby flowering plants became embedded in the middens. Through a laboratory procedure, the pollen can be removed from the dirt and the plant it came from identified (Lesson 3, Unit 3).

If a midden is disturbed and the layers mixed, it becomes impossible to interpret the lifeways and climate of past times. Vandals looking for artifacts dig in middens and they destroy irreplaceable information about the past. They tear pages from the history book of time. It is against the law to disturb archaeological sites on Public Lands.

Procedure: Review the concepts learned in Unit 1: the methods of archaeology and history, culture, observation-inference, and chronology. Ask the students what one could learn about their family by studying their trash. The food they eat and family size are two obvious answers. Explain to the students that they are going to be archaeologists, analyzing garbage to learn as much as possible about the people who threw it away. Demonstrate some of the information that can be learned from garbage by examining a small amount of trash from your classroom trash can:

1. When you interpret human behavior solely on the basis of material objects, you are using the methods of archaeology. If you read written material in the trash and use that information to interpret human behavior, you are using the methods of history. The type of printed material (magazines, newspapers, pamphlets) may be indicative of their former owner's interests.
2. Could the garbage be mistaken for that of another culture? Is the garbage in your classroom trash the same or different from classroom garbage in China? Portugal? Your town 100 years ago?
3. What can you infer about the behavior of the thrower-aways and the origin of the garbage based on your observations? Is cafeteria trash the same as that from the wood shop? janitor's room? the library? How is a rich person's garbage different from a middle-class or poor person's?
4. Arrange the trash in chronological order. On the bottom is the oldest trash, and you are demonstrating relative dating when you can say the upper levels are more recent than the bottom levels. If you find dated items through the trash, such as newspapers or postmarked envelopes, you can establish absolute dating. Change through time may also be evident in your trash. Cafeteria refuse, for example, will change throughout the week, since meals are different everyday.

Finally, introduce students to the concept of context, the relationship artifacts have to each other and the situation in which they occur. If the trash from all of the wastebaskets was mixed together, the particulars about human behavior are lost.

Divide the class into groups of 4-5 students and give each group a bag of trash. Each student, or each group, prepares a 'report' about their archaeological investigation, addressing the concepts outlined above.

Students visit each other's "middens", and a spokesperson from each group presents a summary of their findings.

Summarize the activity by asking students if they feel they have a complete picture of American culture from their study. Lead them to realize that, just as archaeologists must study a great number and wide variety of sites to get a complete view of a past culture, their study gave them only a glimpse of American culture.

Finally, emphasize the importance of leaving archaeological sites undisturbed. Lead students in a discussion about the kinds of information that is lost when vandals dig up sites.

Evaluation: Each student writes a report that addresses one or more of the following. They must substantiate their answers by "evidence". i.e. what artifacts prove their answer?

1. Do the artifacts change throughout the layers?
2. List two inferences you can make about the person who threw the trash away.
3. Do some artifacts tell us more than others?
4. What is the likely place from which the garbage originated?

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UTAH'S FIRST PEOPLE

UNIT 2 OF

INTRIGUE OF THE PAST: INVESTIGATING ARCHAEOLOGY

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UTAH'S FIRST PEOPLE A Unit About Utah's Native People

This unit, consisting of 5 lessons, is a brief cultural history of the Indian people who lived in Utah prior to white settlement. It is most easily integrated into the 4th and 7th grade Utah history curricula as the initial unit about Utah's past. The material can be reviewed in abbreviated form for the history units of other grades to form a basis for comparison with contemporary historic developments in other parts of the world. Such a comparison assists students with integrating historic information on a global basis.

Another teaching option is to feature this unit during Utah Archaeology Week, which is the second week of April each year. While it is preferable to teach the entire unit, each lesson is written so that it could be taught independently. Therefore, some information is repeated in each lesson. Alternatively, an aspect of culture and how it changed through time could be examined. The houses, food, clothing, or tools of Utah's people are examples of cultural elements which could be studied.

This unit is an overview of Utah's prehistoric people, arranged in chronological order from most ancient to recent times. Volumes of data exist about Utah's prehistory. This review is a cursory examination of the salient features of each cultural group, and will give students a sense of past lifeways, but is by no means an exhaustive presentation of what is known. Several excellent publications are recommended in the Resource Guide for teachers wanting more information.

While this unit is divided into cultural periods, bear in mind that these divisions, more than anything else, reflect archaeologists' classifications. They may or may not correspond to prehistoric peoples' perceptions of their society and other societies. For example, the people archaeologists call the Fremont perhaps recognized three or four ethnic divisions amongst themselves, and no separation between themselves and the people today called the Shoshone. Archaeologists classify cultures largely on the character of artifact assemblages, which may not always be accurate reflections of cultural differences and similarities.

The living descendants of prehistoric people are the Native Americans, and seven recognized Indian tribes today live in Utah. It is important to realize that teaching this unit is teaching their history, the story of their past. Teach it with sensitivity and respect, as you would the story of your own ancestral heritage. Also keep in mind that this unit is the archaeological view of their past, which is only one of many possible perspectives. The scenario of the past as told by the things people left behind provides skeletal information about a culture - what people ate, what their homes were like, how their culture changed over time. We cannot know much about the flesh of a culture from material

remains. Archaeological methods cannot provide information regarding what prehistoric people thought about, believed in, and hoped for. We cannot dig up religion, medicinal knowledge, kinship reckoning, dances, festivals, calendar keeping, recipes, child rearing practices, nor a multitude of other aspects of what it means to be human.

Native Americans have a rich tradition passed down from generation to generation through stories, ritual, religion, teaching, and myth about their past and the details of their ancestors' lifeways. They sometimes have a view on the past that differs from the archaeological perspective. It is important to realize that the Native American view and the archaeologist's view are just two different ways of looking at the past; neither one is necessarily inferior or superior to the other, and a choice need not be made regarding which to "believe" in. Archaeology makes inferences about the past based on a scientific analysis of material data. Scientific rules of evidence are applied. To many Native Americans, the past embodies their heritage, and a scientific view based on incomplete evidence is irrelevant. Tradition and cultural identity are much more than simply material evidence. We can appreciate this view by trying to imagine what a "scientific" presentation of American history would be like, based only on material evidence.

Recently, there have been many examples of Native Americans and archaeologists learning about each others' perspectives, and the different kinds of information each group can provide about the past. Most importantly, both Native Americans and archaeologists agree that sites and artifacts should be preserved, and that cooperation in saving the past is essential.

Certain issues, however, remain very sensitive, especially regarding human burials encountered by archaeologists as they excavate sites. Archaeologists often have been insensitive to the spiritual and religious beliefs of Native American people, and unfortunate confrontations have occurred. Conversely, cooperation between archaeologists and Indian people in recovering the Shoshone burials eroding from the east shore of the Great Salt Lake in 1990 demonstrates that the two groups can work together and address their archaeological and religious concerns.

There is a danger of conveying two erroneous concepts when studying the distant past. One is the stereotyping of prehistoric people as primitive and backward, or as noble savages living an idyllic life perfectly in tune with nature. The other misconception is that archaeologists are only interested in artifacts. Both misconceptions can be remedied by emphasizing throughout that archaeologists study people in all their cultural variation. Archaeologists come to understand people by studying the artifacts they left behind, and objects are of interest because they are messengers of the behavior of past people. Objects viewed solely

as mute things are of little use to archaeologists in deciphering the past.

Like all people everywhere, prehistoric Indians exhibited an array of talents and personalities. Some were worriers, and some were light-hearted; there were born leaders and shy people, hard-workers and lazy folks. As a group, prehistoric people possessed incredible skill and understanding of their world, knowledge that enabled them to live successfully in environments that today seem inhospitable to us. Most of us today would not survive a week in the wilds without the accompaniment of many pounds of modern technology. The natural world was the Indian's pharmacy, grocery, department, and hardware store, supplying food and raw materials for all manner of things, from baskets to houses to medicine and clothing. Prehistoric people had a deep and special knowledge of their world, and this fact cannot be trivialized if we are to accurately perceive them.

The prehistory unit is written to emphasize the humanity of past peoples. Throughout, we challenge students to think about the special skills and knowledge that the presented lifeways required. Students can examine the history presented here and ask themselves: how were these people different from me? How were they the same? What concerned them, delighted them, frightened and exhilarated them? What contributions have Native Americans made to our American way of life?

The information presented in this unit is largely derived from archaeological investigations. Lessons in Unit 3 teach the methods of archaeology, and help students clarify their values about archaeological resources. In some ways, it would be more effective to teach the methods of archaeology before the cultural history, to illustrate how archaeologists have pieced together the story of the past. By arousing curiosity about Utah's prehistoric heritage, students will be intrigued and want to know how archaeologists learn about the past. Lessons in Unit 3 which would supplement or illustrate concepts presented in this Unit are referenced throughout.

It will become obvious after studying this unit how little we really understand about the people who lived here millennia before us. The data archaeologists rely upon to tell us the story of the past is fragile, very prone to loss, and is disappearing at an alarming rate. A theme to emphasize throughout this unit is the role every person can play in preserving archeological sites, so that we will have the data which will help us fill in knowledge gaps. It is illegal to collect artifacts and to dig in Indian ruins or historic sites on Public Lands. Don't encourage others to destroy the past by buying artifacts from them. Report violations you witness to law enforcement authorities or land managing authorities, such as the Bureau of Land Management, the US Forest Service, and the Park Service.

Procedure: Preface the unit by discussing with the students that people have lived in Utah for 12,000 years. Their descendants today are American Indians. This unit will enable students to "time travel", to have a view of the many ways people have lived in the same places they do today.

A teaching kit prepared by the Utah Statewide Archaeology Society is available for loan, free of charge, from the Utah Division of State History, and other agencies around the state (Resource Directory). The kit contains examples of artifacts from prehistoric time periods in Utah, and is designed to be a "hands on" learning experience for the students. All items in the kit are meant to be picked up and handled. Teaching this unit along with the teaching kit is highly recommended; it provides a concrete, vivid experience for students about lifeways that have no representation in their experience.

Use the timeline created in the previous unit as a visual aid, pointing out the time periods covered by each lesson. Follow up each lesson with an art activity by having students fill in the timeline with pictures depicting lifeways of each cultural period. At the beginning of the unit, the class can be divided into groups, one group being responsible for one lesson displayed on the timeline.

Additionally, throughout the year each student can build a scrapbook of artwork illustrating past lifeways and events. A scrapbook cover can be designed as an art activity (see Lesson 9, Unit 3 for a rock art activity). The scrapbook would, in essence, be a personal version of the class's timeline, one which the student keeps.

Two other activities are suggested to help reinforce what the students have learned and to provide variety in learning styles. The students could perform skits illustrating some event in prehistory, using items from the teaching kit and/or fabricating their own tools, pottery, clothing, etc. from easily available materials. They could also do a creative writing activity. Have the students transport themselves in time, back to a chosen time period, and describe a typical day in the life of their family.

THE PALEO-INDIANS Lesson 1 of Unit 2 - Utah's First People

AGE:	4th - 7th grades
SUBJECTS:	History, Anthropology
SKILLS:	Description, listening, reasoning, assimilating and integrating data
DURATION:	1 class period
CLASS SIZE:	any

Objectives: Students will 1) understand the lifeways of Paleo-Indians; 2) learn about the now-extinct animals Paleo-Indians hunted, and 3) appreciate the fragile nature of archaeological evidence.

Method: The teacher presents content information about the Paleo-Indian people, using provided illustrations and/or the teaching kit developed by the Utah Statewide Archaeological Society.

Materials: Copycat page for each student, or transparency made from copycat page.

Vocabulary:

artifact - any object made or used by people.

Clovis point - a type of stone projectile point made by early Paleo-Indians for use as a spear tip. Characterized by a short shallow channel on one or both faces. Larger than a Folsom point.

diagnostic artifact - an item that is indicative of a particular time and/or cultural group; a computer would be a diagnostic artifact of the modern-age.

flintknapping - the technique of making stone tools from natural stone.

Folsom point - a type of stone projectile point made by later Paleo-Indians for use as a spear tip. Characterized by a long shallow channel on one or both faces. Smaller than a Clovis point.

Paleo-Indian - the name given to the oldest known cultural group in Utah.

Pleistocene - the Ice Age; the epoch of geologic time from 1.6 million years ago to 10,000 years ago, characterized in North America by periods of glacial advance and retreat.

projectile point - the stone point attached to the end of darts, spears, and arrows. Often erroneously termed "arrowheads". In historic times, some people made metal projectile points.

mammoth - an Ice Age animal related to the African elephant.

megafauna - literally, large animals. Applied to the now-extinct animals of the Ice Age, including mammoths, giant ground sloths, and short-faced bears.

Background: Archaeologists call the earliest people we know of in Utah the Paleo-Indians (paleo meaning ancient). They first appeared in Utah about 12,000 years ago, or 10,000 BC, and they lived all over North America in much the same way. They probably arrived in North America from Asia, traveling across Beringia. During the late part of the Pleistocene, much of the earth's water was frozen in glaciers. As a result, sea levels were lower, exposing more land, such as the Bering Land Bridge (Beringia) between Alaska and Siberia. Today this area is the Bering Sea, with no land connection between the continents.

The Paleo-Indian people are known to us today from sites where they killed and butchered large animals (megafauna), especially the mammoth and an extinct form of bison. Mammoths were enormous animals, a relative of the African elephant. They grew up to 13 feet tall, and could weigh over 7 tons. Mammoths were vegetarians, browsing on grasses and shrubs and adapted to cool climates. Other animals of this time period include the giant ground sloth, giant short-faced bear, camels, saber-toothed lions, tapir, and the Ice-Age horse.

Dramatic environmental changes occurred during Paleo-Indian times. Prior to about 12,000 years ago, "...many basins, now dry and salt encrusted, were fed to overflowing by cool waters, joined by great fish-filled rivers, and tied by riparian ribbons of green. As glaciers carved beds in the snow-capped mountains, woodlands filled the [now] treeless deserts. Herds of camels, horses, and mammoths grazed the steppes and fertile marshes. And then, from 10,600 to 8600 B.C., lakes shrank, rivers ceased to flow, and springs began to dry. Plants and animals started the long retreat northward to higher elevations, or faced local extinction in isolation, and man witnessed the demise of the Pleistocene megafauna. By comparison, most subsequent environmental changes were minor" (Mehringer 1986:49).

As the climate warmed, the mountain glaciers retreated, and Lake Bonneville, which had covered much of western Utah during its Pleistocene maximum, withdrew to become what we now call the Great Salt Lake. Many of the plants and animals which lived during the cool and wet Pleistocene could not survive in the warmer and drier conditions, and either became extinct or moved to areas with

climates to which they were better adapted. As many as 78 species of mammals became extinct during the last of the Pleistocene epoch, and one theory proposes that early hunting peoples may have actually caused the extinction of at least some of these animals (Martin 1986).

Different plants and animals now populated a warmer and drier Utah. Climatic shifts and subsequent changes in plant and animal populations had a profound effect on Paleo-Indian people. They had to either adapt by changing their lifeways, or perish.

Compared to later prehistoric people, we know very little about the lifeways of the Paleo-Indians. There are several reasons for this. The population of Paleo-Indians was very small, and they lived in mobile bands; thus, the material remains they left behind are scanty and subtle, unlike villages built of stone by some later peoples. In addition, since these sites are of great antiquity, they have been exposed to destructive forces for millennia; erosion, burial, decay, and disturbance by later people have all taken their toll.

The most distinctive artifacts of Paleo-Indian people are various types of spear points (teaching kit). These points are diagnostic artifacts, items identified as having been made by a particular cultural group. Clovis points are the earliest type, followed by Folsom points. Clovis and Folsom points are called fluted points, because of a shallow lengthwise channel on one or both faces. The reason for this channel, or flute, is not certain, although several functions are possible: perhaps it made it easier to haft (attach) the point to a spear; like the channel of a bayonet it may have caused the animal to bleed more, hastening its death; since spears were repeatedly thrust into an animal to kill it, the groove may have facilitated efficient removal; or, the flute may simply have been the preferred style. In any case, modern flintknappers have found that making a fluted point requires considerable skill, especially to make the flute without breaking the point.

Paleo-Indian people are most well-known as hunters of big-game, or megafauna, such as mammoths and Bison antiquus, an extinct form of buffalo. Several famous sites in North America contain megafauna bones with spear points beside or embedded in them. While none of these sites are in Utah, several mammoths and other megafauna have been found within the state. Many Clovis and Folsom points have also been discovered in Utah. Petroglyphs (figures pecked on stone) of mammoths have been discovered in Utah, so we know that Paleo-Indian people were here before mammoths became extinct.

After about 8000 B.C., we see a wide variety in types of stone points, including Eden points (teaching kit). People were relying upon a more mixed base for subsistence, and tools were made to process plant foods and a variety of mammals, fish and fowl. By 6000 B.C., lifeways had become sufficiently different that

archaeologists label this more recent time period the Archaic period.

This apparent shift in lifeways raises an interesting question - how reliant were Paleo-Indian people on foods other than megafauna? Since most of what we know about them is from bison and mammoth kill sites, there is a tendency to think of them as solely meat-eaters, stalking large and dangerous animals. Certainly these people used a variety of plant and small animal resources, and killing a mammoth was in all likelihood a once or twice in a lifetime event. The nature of the archaeological record leaves a lot of room for speculation on Paleo-Indian lifeways.

Hopefully, someday archaeologists will find Paleo-Indian sites that have been preserved well enough to tell us a more complete story about how these people lived and how they adapted to a changing climate. What if there was a site with a Clovis point on the ground surface, and someone came along and took the Clovis point home with them, without even notifying an archaeologist? The information contained in these sites is so fragile, so easily destroyed, that archaeologists worry that we will never be able to learn more about people from so long ago. But, if everybody remembers to leave artifacts where they are found, there is a good chance that we will be able to solve the mysteries about these past people.

Summary of Key Points:

- Paleo-Indian people arrived in North America by 12,000 years ago, during the Pleistocene, probably crossing the Bering Land Bridge from Asia to Alaska.
- Paleo-Indians hunted megafauna, such as mammoths, but also relied on plants and small animals for food. They made distinctive spear points called Clovis, Folsom, and Eden points.
- The climate changed dramatically at the close of the Pleistocene, megafauna became extinct, and Paleo-Indian people adopted an Archaic lifestyle by about 8000 years ago.
- Paleo-Indian archaeological sites are especially fragile and easily destroyed. Everyone can help preserve sites and information about past lifeways by not collecting artifacts or digging sites.

Procedure: Tell the students that they are going to "time travel" to the Utah of 12,000 years ago. Refer to the timeline created for the previous unit. It is very effective to have students first visualize the climatic setting of the past, and then project cultural information into the setting. Either give each student a copy of the copycat page, or project the copycat page

with an overhead projector. Present the content material to the students, emphasizing the key points. If using the teaching kit, show students the appropriate artifacts as the material is presented. After the lesson, allow them to pick up and examine the artifacts. Follow this lesson by having the assigned group illustrate the timeline created in the previous unit, and with an activity, such as a skit, role play, creative writing, or art.

Extension: The Utah Museum of Natural History has a fine Ice Age exhibit, including a display of Ice Age animals.

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Copycat Page Source:

projectile points - Fagan 1980:124.

1) True or False?

F Paleo-Indian people grew corn and lived in stone houses.

T Paleo-Indian people were very skilled flintknappers.

T Mammoths are similar to modern-day elephants.

T The bison that Paleo-Indian people hunted were not the same type of bison that live today.

F Paleo-Indian people probably ate nothing but meat.

F Archaeological evidence about Paleo-Indians is plentiful.

T One person could destroy the chances of knowing more about Paleo-Indians just by picking up a Clovis point from a Paleo-Indian site and taking it away with them.

F The climate during Paleo-Indian times was warmer than today.

2) Write a paragraph about what you would tell somebody you saw taking a Clovis point. Be sure you give them a reason for what you tell them they should do.

A Clovis point is diagnostic of the Paleo-Indian culture. We have very little information about the Paleo-Indian people, and removing a Clovis point from a site means that archaeologists may not be able to tell it is a Paleo-Indian site. Information about these ancient people, contained in the site, is therefore lost to us.

3) Name two reasons we know so little about the Paleo-Indian people.

They left little behind for archaeologists to study because their 1) population was small, 2) they lived a mobile lifestyle, and 3) did not build lasting homes; the sites are very old so they have been subject to 4) erosion, 5) burial, 6) decay and 7) disturbance by later people for thousands of years.

4) Imagine you are living in Paleo-Indian times. Describe two skills or pieces of special knowledge you would need to survive that you don't now have.

How to hunt, kill, butcher and preserve the meat from large animals; the habits of game animals; how to flintknapp spear points; where to find stone for toolmaking; edible plants and their location and season of ripeness; knowledge of a large geographic area.

1) True or False?

___ Paleo-Indian people grew corn and lived in stone houses.

___ Paleo-Indian people were very skilled flintknappers.

___ Mammoths are similar to modern-day elephants.

___ The bison that Paleo-Indian people hunted were not the same type of bison that live today.

___ Paleo-Indian people probably ate nothing but meat.

___ Archaeological evidence about Paleo-Indians is plentiful.

___ One person could destroy the chances of knowing more about Paleo-Indians just by picking up a Clovis point from a Paleo-Indian site and taking it away with them.

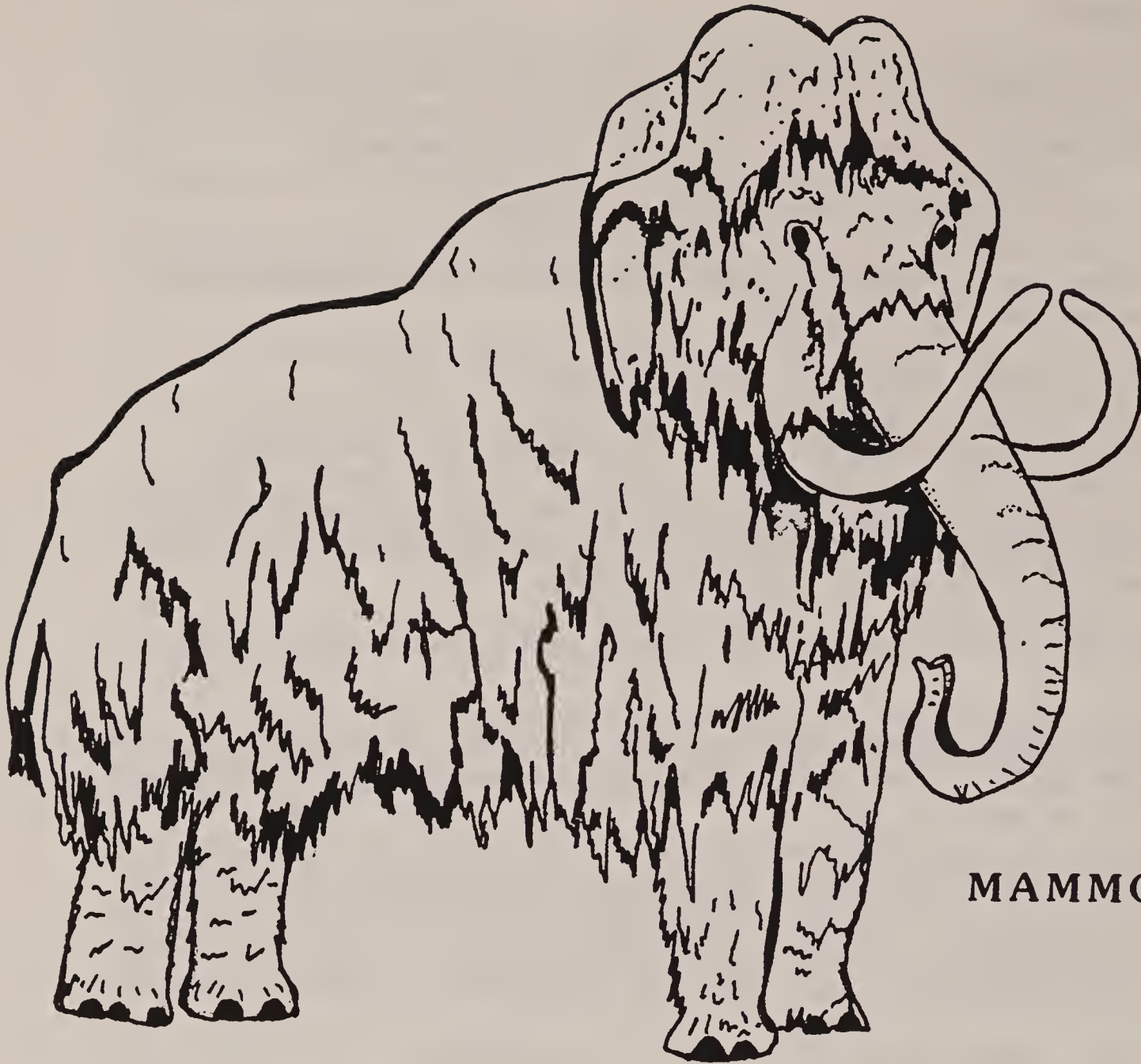
___ The climate during Paleo-Indian times was warmer than today.

2) Write a paragraph about what you would tell somebody you saw taking a Clovis point. Be sure you give them a reason for what you tell them they should do.

3) Name two reasons we know so little about the Paleo-Indian people.

4) Imagine you are living in Paleo-Indian times. Describe two skills or pieces of special knowledge you would need to survive that you don't now have.

PALEO-INDIAN



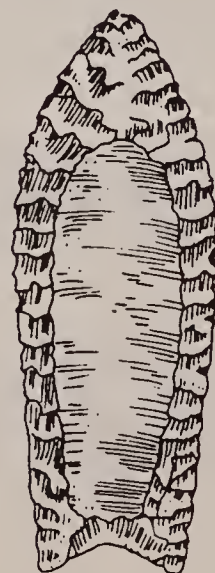
MAMMOTH

SPEAR POINTS

actual size



CLOVIS



FOLSOM



EDEN

AGE:	4th - 7th grades
SUBJECTS:	History, Anthropology
SKILLS:	Description, listening, reasoning, assimilating and integrating data
DURATION:	1 class period
CLASS SIZE:	any

Objectives: Students will 1) understand the lifeways of Archaic people; 2) understand the concept of representativeness; and 3) appreciate the fragile nature of archaeological data.

Method: The teacher presents content information about the Archaic people, using provided illustrations and/or the teaching kit developed by the Utah Statewide Archaeological Society.

Materials: Copycat page for each student, or transparency made from copycat page.

Vocabulary:

artifact - any object made or used by people.

atlatl (AT-lat-l) - a throwing stick, used to launch stone-tipped darts.

core - a prepared nodule of stone which a flintknapper strikes to remove thin flakes of stone; the remnant chunk of stone left after flintknapping.

diagnostic artifact - an item that is indicative of a particular time and/or cultural group; a computer would be a diagnostic artifact of the modern-age.

flake - a thin piece of stone removed from a nodule by striking it with a flaker made of bone, antler, or other stone. Flakes have sharp edges, and could be used as cutting implements. Flakes were also further shaped into tools, or were left as waste by-products of flintknapping.

flintknapping - the technique of making stone tools from natural stone.

mano - the shaped hand-held stone used to grind grains, nuts, seeds, and mineral pigments, by moving it back and forth on a metate.

metate - a shaped stone slab used as a base upon which grains, nuts, seeds, and mineral pigments were ground with a mano.

Background: The Archaic cultural stage was, like the Paleo-Indian stage, widespread over most of North America, but with local characteristics that made it distinctive from place to place. In Utah this stage persisted from about 6000 B.C. until A.D. 400 (from approximately 8000 years ago until 1600 years ago.) Utah Archaic culture is also called the Desert Culture.

If one word could describe the Desert Culture people, it would have to be 'adaptable'. "The Archaic, comprising a myriad of special tools and utensils to meet a varied subsistence base, can be regarded as technologically far more versatile and complex than the preceding stages. Subsistence varied from season to season as it focused first on one species or one ecosystem and then on another; the artifact inventory was comparably expanded" (Jennings 1978a:128).

The climate of Utah during Desert Culture times was ever-changing. The warming trend of Paleo-Indian times, which had resulted in the glaciers retreating and Lake Bonneville shrinking, continued. The climate was warmer and drier than today until about 4000 years ago (2000 B.C.), when the trend reversed and the weather became increasingly cooler and wetter. The Great Salt Lake expanded, creating a shallow lake in the West Desert. By the end of the Archaic period 1600 years ago (A.D. 400), the climate was settling into a pattern much like ours today, although it was slightly warmer up until 600 years ago.

While the climate was gradually changing, the year to year weather variations that the Archaic people encountered were often extreme. The same situation exists today. Weathermen talk of yearly rainfall being above or below normal, for example. The extremely wet years of 1982 and 1983 resulted in a dramatic rise in the Great Salt Lake, and low precipitation in 1990 caused drought in many parts of Utah. Even though we are fairly insulated by technology from the effects of this moisture fluctuation, our society did have to respond to it. A rise in taxes to fund the pumping project to lower the Great Salt Lake impacted everyone economically, as does water rationing in drought years.

The Archaic people were not farmers, but lived in small nomadic groups that moved from place to place throughout the year to harvest ripe plants and to hunt or fish. They were remarkably knowledgeable about the life cycles of probably hundreds of plants (used for food, making baskets and clothing, medicine, nets, and mats), the migratory patterns and habits of fish and animals, and

the geography of a vast area. They had to know where plants and animals lived, where stone for making tools was to be found, and where good campsites with firewood and water nearby could be had. They were a skilled people, fashioning intricately woven and even waterproof baskets, sandals, fur robes, nets and snares, and a variety of stone tools and dart points. As Jesse Jennings, a prominent Utah archaeologist succinctly expressed "One must realize that the 'wandering' was neither aimless nor random. Rather, it reflected lifelong and intimate year-round knowledge of a territory where mineral, plant, animal, and water resources were to be found" (Jennings 1978a:245).

Since the Archaic people lived so close to nature, and since the Utah climate varied substantially from year to year, they had to be adaptable to the changes in availability of the plants and animals they depended upon. For example, marshes have attracted people for thousands of years, because they supply water, and support waterfowl and their eggs, fish, game, and an abundance of edible plants, all concentrated in a small area. Archaic people could have lived quite comfortably near a marsh most of the time, but during a wet year, the marsh could be flooded and the resources would be unavailable. Another survival strategy was then necessary. Perhaps people moved to the uplands to concentrate more on hunting game, or to pinyon forests to harvest pine nuts, or to a lake to rely upon fishing for food. The different subsistence strategies Archaic people employed required different kinds of knowledge and skills, and their tools were comparably varied.

The hallmark artifacts of the Archaic people are baskets and grinding stones. They collected, processed and ate a variety of seeds and nuts, highly nutritious foods that store well (teaching kit). They were ground into a paste or flour on a metate, a slab of shaped stone. A handheld smaller stone, a mano (teaching kit), was moved back and forth over the nuts or seeds on the metate (the Division of State History will loan a metate with the teaching kit, and students can grind seeds or grain with it). The flour could then be cooked as a mush or gruel by stirring it in a basket of water, then heating it by placing hot stones from a campfire into the basket.

The Archaic people were also hunters. Sometimes people with an Archaic lifestyle are referred to as hunters and gatherers, as opposed to people who farm or raise animals. They hunted using an ingenious weapon - the atlatl, or throwing stick. A dart with a stone point on one end was laid on the atlatl, then held over the shoulder. The hunter launched the dart by holding on to the atlatl and propelling it forward, shooting the dart further and harder than possible without the atlatl. The atlatl functioned as an extension of the hunter's arm, so he had more leverage to throw with. Some of the common dart point types of the Archaic people are called Silver Lake, Pinto, Elko, and Gypsum projectile points (teaching kit). "Flakes" are the debris from flintknapping, and

a core is the piece of rock remaining after the flintknapper has removed the piece of stone he or she wants to manufacture into a tool (teaching kit). Incidentally, flakes and cores are not limited to Archaic flintknapping, but occur worldwide throughout prehistory.

Most of what we know about the Archaic people comes from sites excavated in caves or rockshelters. Two of the most famous cave excavations are Hogup Cave and Danger Cave, located near Wendover and now a State Park. Caves are exceptionally informative about past people, because perishable artifacts are often preserved in them, and because they allow archaeologists to study how culture and climates changed over thousands of years. The dust and sand blowing into the caves covered up artifacts and living areas, essentially sealing pages of the past from disturbance by people who came later on, and who left their artifacts on the new surface. These many surfaces where people lived are stacked up in the caves like pages of a book, and archaeologists can analyze the site a level (page) at a time to reconstruct the long story of the past.

Archaic people lived in caves during the seasons when desirable plants or animals were available nearby. Since they expected to return to the caves year after year, they often left supplies there for their next visit. Caches have been found that include nets used to ensnare rabbits, hides, rope, mats, sandals, snares, stone tools, grinding stones, and seeds. Split-twigg figurines have also been found in caches; these figurines are small creatures made by bending and wrapping a split twig into an deer-like shape. Their function is not known, but they are frequently discovered in Archaic caves. Another special artifact found in caves is shell from the Pacific coast. Even in early Archaic times, people had contacts with other groups, and established trade routes over great distances.

While archaeologists are fortunate to have such extraordinary preservation in Archaic caves, it is limited information. We know Archaic people only spent part of the year in caves, but we have very little information about how they lived the rest of the time. For example, we don't know what kinds of houses they constructed, although it seems they might have been similar to later peoples' wickiups (brush structures) and pithouses. Their baskets, snares, mats, etc. did not preserve in open, unsheltered sites. As a result, we have a very good picture of a small piece of the whole lifeway. We do not have a representative perspective on the Archaic people.

Studying the Archaic people only from cave evidence is like trying to understand the life of an American grade school student by only looking at evidence found in his or her school classroom. We would understand very well what occurs in the classroom, but that doesn't represent the student's whole life. We would have a much more complete picture of the student if we were able to study everywhere

she goes, and observe everything he does. Likewise, archaeologists hope to have a clearer view of the Archaic people by finding and studying all the kinds of places they frequented. This can only be accomplished with the assistance of everybody helping to preserve sites. Don't collect or dig for artifacts, and don't buy artifacts. Notify law enforcement personnel or land managing agencies if you see someone breaking the law by collecting or digging for artifacts on Public Land.

Summary of Key Points:

- Desert (Archaic) Culture people lived in Utah from about 6000 B.C. till A.D. 400. They lived a mobile hunting and gathering lifestyle, and were well-adapted to climatic fluctuation.
- Desert Culture people had a vast knowledge of the natural world, the plants, animals and mineral resources upon which their survival depended. They manufactured a wide array of tools and implements, including baskets and grinding stones.
- Most of what we know about the Desert Culture people comes from cave excavations, but caves were only inhabited for part of the year. We do not have a representative picture of Archaic lifeways, since caves provide only part of the story.
- Archaeologists need the help of everyone in preserving sites. If people continue to illegally dig sites and collect artifacts, archaeologists will not be able to study the past, and address research topics such as an understanding of Desert Culture peoples' year-round lifeways, and how people adapt to a changing climate.

Procedure: Tell the students that they are going to "time travel" to the Utah of 8,000 years ago. Refer to the timeline created for the previous unit. It is very effective to have students first visualize the climatic setting of the past, and then project cultural information into the setting. Either give each student a copy of the copycat page, or project the copycat page with an overhead projector. Present the content material to the students, emphasizing the key points. If using the teaching kit, show students the appropriate artifacts as the material is presented. After the lesson, allow them to pick up and examine the artifacts. Follow this lesson by having the assigned group illustrate the timeline created in the previous unit, and with an activity, such as a skit, role play, creative writing, or art.

Extensions: Making Cordage (Lesson 4, Unit 3) is an activity that teaches students to make cordage, an item the Archaic people used extensively.

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Copypat page sources:

atlatl drawings - Powell and Gumerman 1987:34-35
projectile points - IMACS manual
split-twig figurine - Jennings 1978a:82
mano and metate - Jennings 1978b:141
sandal - D'Azevedo 1986:199

Write a sentence explaining why statements 1 - 4 are false.

1. Archaeologists have learned all there is to know about how Desert Culture people lived from studying cave sites.

Since Desert Culture people only spent part of the time living in caves, we understand only a portion of their lifeways from studying cave sites.

2. Archaeologists seldom find baskets in Desert Culture sites.

Desert Culture people are known for the many varied types of baskets they made, and baskets preserved well in cave sites.

3. Desert Culture people were very primitive, and were not as intelligent as people are today.

Desert Culture people knew a phenomenal amount of information about their world, as were every bit as intelligent as people are today.

4. If people dig holes in Archaic cave sites, it doesn't really hurt anything.

Digging holes in cave sites disturbs artifacts and their arrangement. Archaeologists then have a difficult time learning about past people, since the evidence they left behind has been disturbed.

5. You are living in Desert Culture times, and your family has been returning to a cave near a marsh every spring for ten years to harvest cattail roots and duck eggs. It has been raining for three weeks now, and there was an unusually high snowfall this past winter. What are you worried about?

The rain and greater snowmelt might flood the marsh, and the cattail roots and duck eggs would then not be available. Your family will have to move elsewhere to look for food.

6. Name two special skills or pieces of knowledge that Archaic people had which allowed them to survive.

Vast knowledge of 1) locations and 2) seasons of plants and animals, 3) location of stone for making tools, 4) geographic understanding of a large territory, 5) great skill in making many kinds of baskets, and 6) stone tools, 7) skill in hunting game and preserving meat.

Write a sentence explaining why statements 1 - 4 are false.

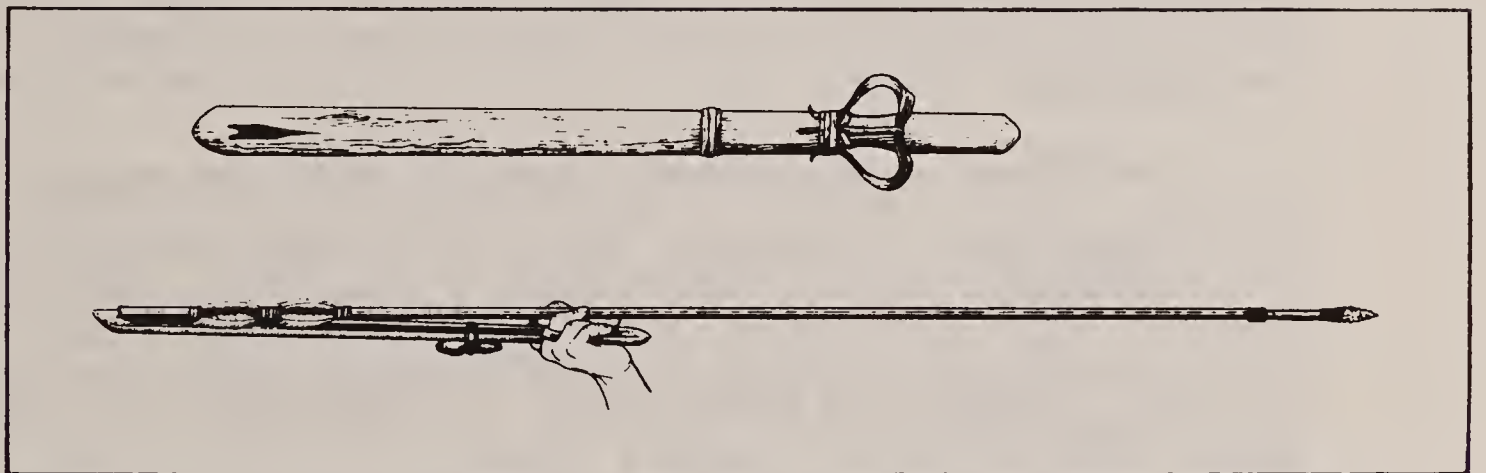
1. Archaeologists have learned all there is to know about how Archaic people lived from studying cave sites.
2. Archaeologists seldom find baskets in Archaic sites.
3. Archaic people were very primitive, and were not as intelligent as people are today.
4. If people dig holes in Archaic cave sites, it doesn't really hurt anything.
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ARCHAIC

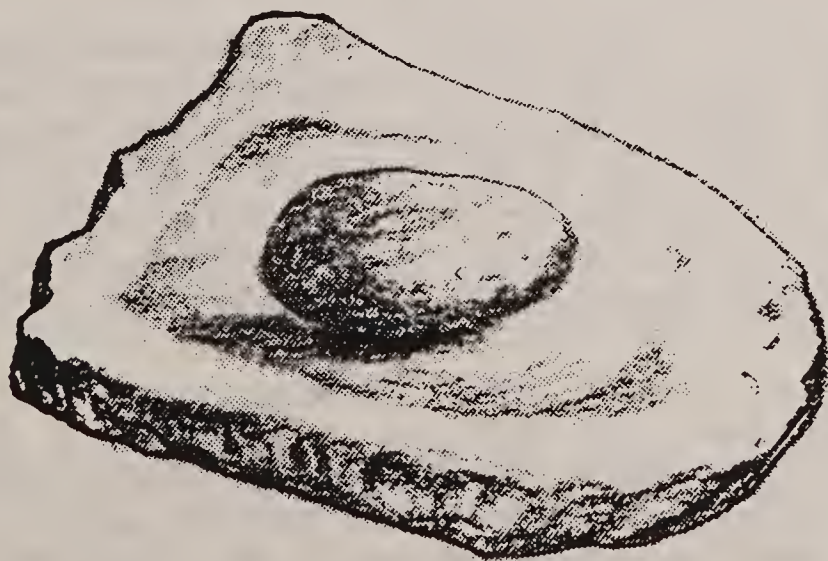


ATLATL POINTS

ATLATL AND DART



SPLIT-TWIG FIGURINE



MANO AND METATE



SANDAL

THE FREMONT PEOPLE Lesson 3 of Unit 2 - Utah's First People

AGE:	4th - 7th grades
SUBJECTS:	History, Anthropology
SKILLS:	Description, listening, reasoning, assimilating and integrating data
DURATION:	1 class period
CLASS SIZE:	any

Objectives: Students will 1) understand that the Fremont and the Anasazi lived in Utah at the same time; 2) understand the lifeways of Fremont people; 2) analyze some of the social consequences of living in settled villages; and 3) understand what they can do to help preserve archaeological sites.

Method: The teacher presents content information about the Fremont people using provided illustrations and/or the teaching kit developed by the Utah Statewide Archaeological Society.

Materials: Copycat page for each student, or transparency made from copycat page.

Vocabulary:

artifact - any object made or used by people.

ceramics - vessels made of fired clay; synonymous with pottery.

cultigen - a plant which is dependant on humans to grow and reproduce.

pithouse - a type of structure built partly underground, so that the earth forms all or part of the side walls.

Background: The time period between about A.D. 400 and A.D. 1300 is called the Formative stage in Utah, and two groups of people lived here then, the Anasazi and the Fremont. The Anasazi lived primarily in the Four-corners region, generally south of the Colorado River, and in southwestern Utah. The Fremont occupied the remainder of the state, and into eastern Nevada, western Wyoming and Colorado, and southern Idaho.

The Fremont and the Anasazi shared several traits that revolutionized the earlier lifeways of the Archaic time period: they both grew corn, beans and squash, built substantial homes and lived in villages, and both groups made pottery. Corn was first grown in Mexico, and the seed and knowledge of how to grow it were

transferred northward. There is evidence of corn being grown as early as 500 B.C. in Utah, but it was not relied upon as a staple. It seems that people planted small plots of corn, but continued to rely mostly on gathered and hunted wild foods.

There is a good deal of variation in Fremont sites across the state, and it may be that these people thought of themselves as more than one group or culture. People structured their lives around different kinds of resources in different parts of the State. For example, they were heavily marsh-dependant in the central Utah river valleys, like Richfield. On the Wasatch Plateau, farming villages prevailed. In the West Desert, cave sites like Hogup Cave continued to be occupied intermittently. Numerous small Fremont campsites attest to the fact that many Fremont people continued to live a mostly hunting-gathering lifestyle. Despite this variation, Fremont people did share several distinctive traits.

Three principal traits identify the Fremont lifeway: gray pottery, pithouses, and at least some corn cultivation. The Fremont people manufactured a well-made gray ware ceramic, in the form of narrow-necked jars (some with loop handles) and bowls. After about A.D. 700, the people started to make painted types of pottery, beautiful geometric designs of black on a white or grey background. Fremont ceramics are reminiscent of Anasazi wares in form and decoration, although the raw materials used to make the pottery are distinctive between the two groups (the teaching kit has several examples of Fremont pottery).

Pithouses have their earliest beginnings in Archaic times, but it was during the Fremont period that we see substantial pithouse villages. Pithouses represent a significant labor investment to build, but in return, they are a very fuel efficient type of home to heat. Using sharpened sticks, called digging sticks, Fremont people excavated a shallow round or rectangular depression, usually between 4 and 7 meters (12 to 22 feet) across. Four upright beams set in the floor supported roof beams, while smaller poles leaned against the roof beams formed the sloping walls. Matting of sagebrush, juniper bark, or other plant fiber was woven through the poles, and the whole structure was then covered over with earth and sealed with clay. Sometimes the base of the walls was lined with stone slabs or clay, or the walls were built of stone masonry or adobe. Inside, a central fireplace was shaped of clay, with a rim around its edge. Directly above it was the smokehole opening. Many Fremont pithouses are also characterized by a ventilator shaft, a small tunnel that allowed fresh air to move through the pithouse and out the smokehole. The ventilators may also have been used for entranceways.

Associated with pithouses are surface storage rooms and granaries, often built into small cliff overhangs. These structures are of stone masonry and adobe mortar, or are completely built of adobe.

They served as rodent-proof storage units for corn and wild seeds and nuts (teaching kit).

Fremont pithouse villages are typically small, with probably only 3 to 4 houses occupied at any one time. An area rich in resources, such as the Sevier Valley, could have supported many hundreds of people, their homes scattered throughout the valley. One problem in the study of such Fremont sites is that these areas were also very attractive to the early farming pioneers. The pioneers built their villages on top of the older Fremont villages, and then the pioneer villages became towns and even small cities. Today it would be impossible to conduct an extensive excavation in Richfield, for example, because houses, roads, shopping centers, schools and farm fields cover evidence of the earlier people. Every so often, construction workers will accidentally dig into a Fremont site, as happened in Richfield in 1976 when the technical school was being built. Archaeologists were able to excavate a small portion of the Fremont village there; they named the site Backhoe Village!

The largest Fremont village ever discovered is called Five-Finger Ridge, located south of Richfield and excavated during the construction of Interstate 70. A local third-grader, Steven Magleby, became an archaeological hero and truly saved this site from destruction. His school visited a nearby site, Icicle Bench, which was being excavated by archaeologists prior to building Interstate 70 over top of it. Steven told his father about the site they had visited, and Mr. Magleby became concerned about a site he had been shown as a boy. He and Steven went to visit the archaeologists at Icicle Bench, and then showed them the large village which came to be known as Five-Finger Ridge. If Steven had not had such an interest in archaeology, and told his father about their school visit, there would not be a Fremont Indian State Park today, and we would have lost much unique and valuable information about the Fremont for all time. Sometimes, one person can make a world of difference! (An excellent video about the archaeology of the area is available from the State Park, entitled Fremont Indian State Park).

The Fremont people made unusual and interesting figurines from clay, decorated with elaborate necklaces and facial decorations (teaching kit). The figurines are rather rare, and are sometimes found associated with stored corn. Perhaps the figurines served in some agricultural fertility ritual, or had a religious meaning. Some rock art figures, looking very much like the figurines, may also have been made by the Fremont people.

While the Fremont people did grow corn, beans and squash, and some villages seemed able to rely mostly on cultigens, evidence indicates that the Fremont were still hunters and gatherers of wild foods. The bones of deer, mountain sheep, bison, antelope, and rabbits are frequent food scraps at Fremont sites, as are charred

wild seeds and plant parts. They also ate insects, especially grasshoppers and crickets (teaching kit), which were a nutritious, easily gathered, and storable food source. (In fact, the pioneers ate "desert fruitcake", a mixture of wild fruits and insects that they got from the Indians. It saved their lives in some cases, and was reportedly rather tasty. While this thought is repugnant to many of us today, it is useful to remember that food choices are culturally-defined. Hindus, for example, find it abhorrent to eat cow meat). Fremont baskets, made using a distinctive method, were probably used to carry and process wild seeds and nuts. They also made a deep-troughed metate with a shelf at one end, called a Utah metate, used to grind both corn and wild plants.

The Fremont people had an invention that made them more efficient hunters - the bow and arrow. They could shoot further, with more force and accuracy than with the Archaic atlatl. Their arrows were much smaller than atlatl darts, and so were the stone points. One common type of Fremont arrowhead is the Rose Spring type (teaching kit). These are the first true "arrowheads" in Utah. Archaeologists term stone points "projectile points", and use "arrowheads" only to specify points that were really used on arrows. Arrow points are generally smaller than atlatl dart points.

The transition from living in small groups with a nomadic lifestyle to becoming a village-dwelling farmer requires changes in how a society works, and also makes certain traits more likely or more common. For instance, nomadic people seldom use pottery; it is simply too heavy and too fragile to be worth the extra care and effort to have it. Nomadic people usually do not invest the time and labor in substantial sorts of homes, like pithouses, which are snug and efficient, but which require constant maintenance to keep waterproof. Once people begin to farm, all of their stored food for the winter is in one place. The hunter and gatherer can move to where the food is, and to caches of wild foods they gathered to support themselves for short periods. Generally, nomadic people traveling on foot have few possessions that they carry with them.

In contrast, village dwellers amass many more items than nomadic folk. They are committed to having at least part of the population remaining at the village full-time, to protect the fields and stored food, and to maintain houses and storage structures. A corollary of settled life is a growth in the arts, such as painted pottery and rock art, and more elaborate or labor-intensive artifacts. New social mechanisms are called into place. Since more people are living in a small area, some sort of communal decision-making is necessary. Disagreements inevitably arise between people, and now must be settled in some way other than the departure of the offended party, which is the common solution among nomads.

Among settled people, labor is more efficient if some people become specialists at certain tasks, leaving other necessary daily tasks to other specialists. An expert flintknapper may exchange his or her fine stone knife for a well-crafted bowl made by a potter. Politics, economics, social control, and many other aspects of life change when living a settled life. After a while, even settled daily life alters, because game, plants, and firewood located near the settlement have been depleted, and people need to forage further away for these resources.

One of the seminal questions anthropologists are trying to answer is why people living an adequately-provisioned nomadic life decide to settle down to harder work and a sometimes more risky lifestyle. Studies around the world have shown that hunters and gatherers often have more leisure time than farmers do. They can also be better equipped to deal with disasters and accidents. Imagine a farming community experiencing the third year of drought in a row, with resultant meager corn supplies. There are very few choices available to this group. They can either try to tough out the winter and expect some of the villagers to die of starvation, or they can abandon their substantial investments in their homes, fields, and furnishings, and return to a hunting gathering lifeway. They probably will not be efficient at this, since this has not been their experience. Hunters and gatherers, on the other hand, enjoy a great deal of flexibility; if pine nuts are not producing in one area one year, they can easily move to another area, or exploit another wild resource. The archaeology of the Fremont people may help us answer this interesting question, since they appear to have lived all along the continuum of settled to nomadic lifeways. Perhaps, if we could understand how they made their decisions to roam or stay put, we could answer the bigger question of the transition to settled life.

Some time around A.D. 1275, distinctive Fremont artifacts were no longer being made. The fate of the Fremont people is one of the primary questions archaeologists are trying to answer. Did the Fremont abandon the area due to a widespread drought? Did they leave because Numic people (ancestors of modern Shoshone, Paiute, and Ute people) moved into the area, and forced them out? Or, did the Fremont intermarry with the Numic people and become archaeologically unrecognizable as a distinct group? Some Native American groups believe that they are the direct descendants of the Fremont people.

This question is going to be especially difficult to answer unless everyone will work to protect archaeological sites. Since the Numic people are the most recent of prehistoric folks to live in Utah, the artifacts they left behind are on or near the modern ground surface. In sites where the Fremont layers are buried beneath the Numic remains, such as in caves, there is the potential to analyze the relationship between the two groups. Unfortunately, looters and vandals illegally digging for artifacts have disturbed

the top levels of these sites, where Numic and Fremont remains lie. The few remaining sites with this potential are our only hope of answering the question of the fate of the Fremont, and of studying the early history of modern day Numic descendants.

Summary of Key Points:

- Fremont people lived in Utah from about A.D. 400 - 1200. There is much variety in Fremont lifestyles throughout Utah, but generally they were part-time farmers and part-time hunters and gatherers.
- Fremont people lived in pithouses and made pottery. They grew corn, beans and squash, like their Anasazi neighbors to the south. They also used marsh resources.
- Fremont people hunted with bows and arrows. They made intricate human figurines from clay, rock art, and baskets.
- Living in villages instead of being nomadic causes many social changes, among them the need for group decision making, ways to resolve disagreements, labor specialization, a growth in arts and the number and types of possessions.
- Settled farmers can have a more risky and laborious lifeway than nomadic hunters and gatherers.
- The largest Fremont village ever excavated was discovered because of the actions of a schoolboy. One person can have an enormous impact on saving the past.
- The fate of the Fremont people and their relationship to later Numic people is unknown. Everyone's help is needed to preserve archaeological sites, so that we will be able to answer questions about the past.

Procedure: Tell the students that they are going to "time travel" to the Utah of 1,600 years ago. Refer to the timeline created for the previous unit. Remember to divide this portion of the timeline in half, so that both Anasazi and Fremont cultures can be shown. Either give each student a copy of the copycat page, or project the copycat page with an overhead projector. Present the content material to the students, emphasizing the key points. If using the teaching kit, show students the appropriate artifacts as the material is presented. After the lesson, allow them to pick up and examine the artifacts. Follow this lesson by having the assigned group illustrate the timeline created in the previous unit, and with an activity, such as a skit, role play, creative writing, or art.

Extensions: Exploring the Fremont by David B. Madsen is an illustrated book about the Fremont, written for laymen. It is recommended for upper grade levels.

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projectile points - IMACS manual
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ceramics, necklace - Jennings 1978b:154
figurine - Madsen 1982:cover
pithouse - Madsen 1989:8.

1. Would you rather be a Fremont person who lived in a village, or in a small nomadic group? Why?

Some elements that could be discussed include the desirability of having more possessions and living with many people, versus the freedom of being able to move about easily and among fewer people. Settled life can be more risky than the flexible hunting and gathering lifeway.

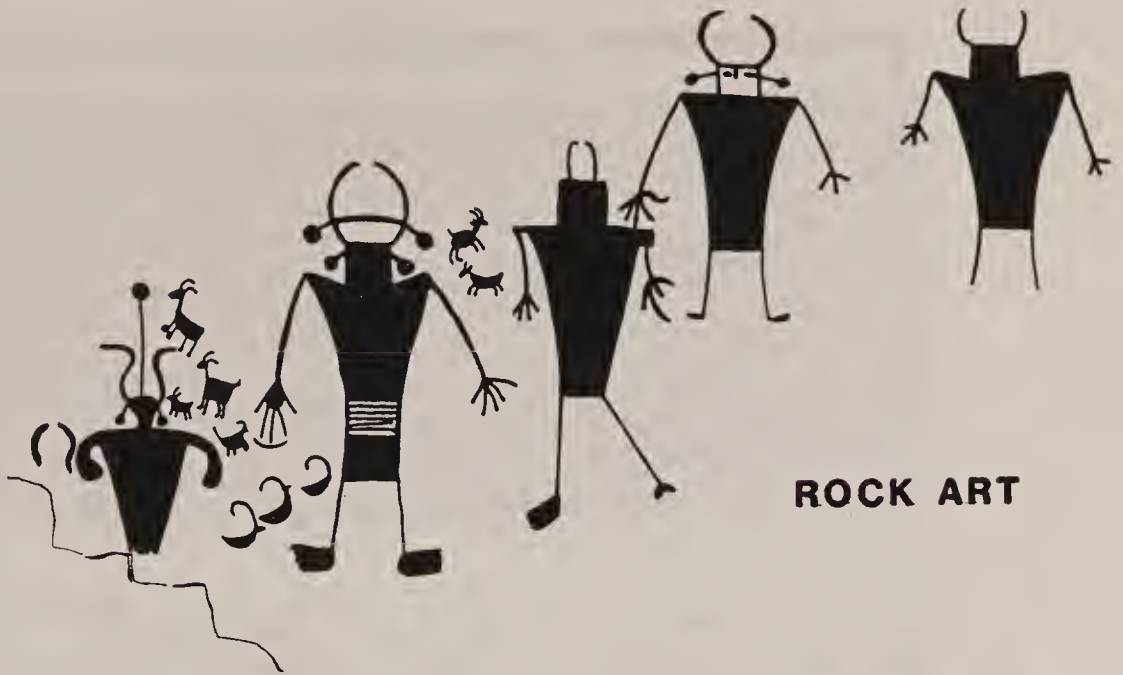
2. You are out with your family exploring the West Desert. You come upon a cave, and see some people carrying shovels into the cave. They are talking about digging for arrowheads. How would you explain to them why they should not do this?

It is illegal to dig sites on Public Land. Digging in a cave site might destroy evidence of the relationship between Fremont and Numic people. Digging rearranges artifacts, and archaeologists then cannot reliably reconstruct the story of the past there. Illegal digging destroys the clues left by past people.

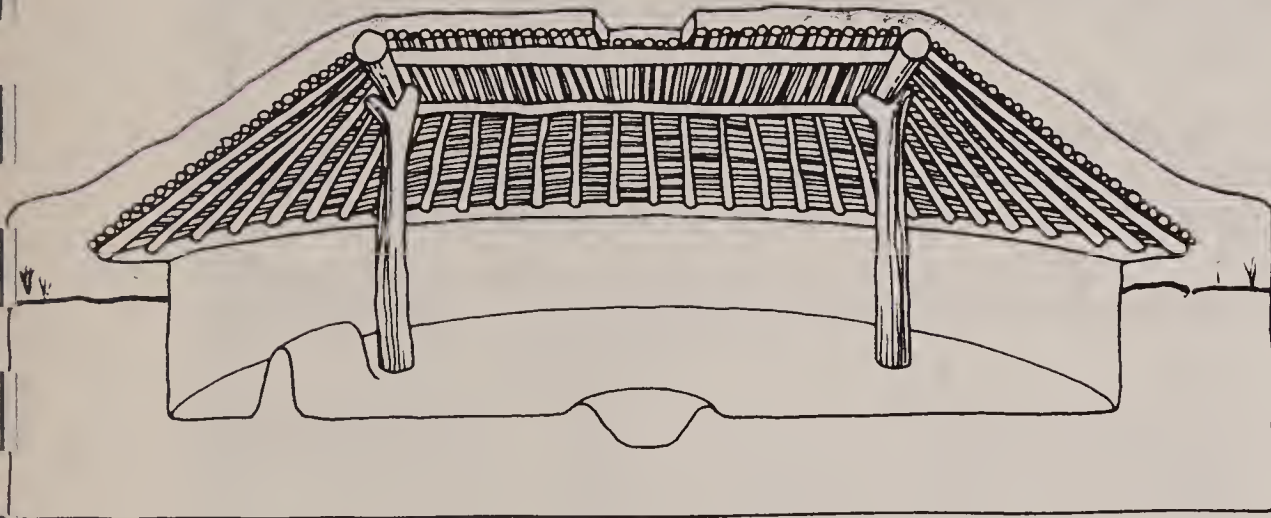
FREMONT



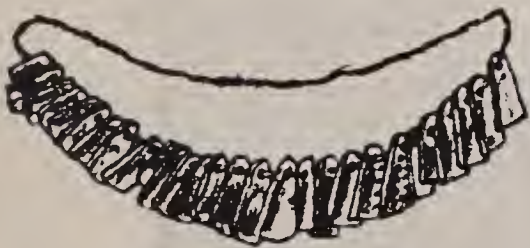
ARROW POINTS



ROCK ART



PITHOUSE



BONE NECKLACE

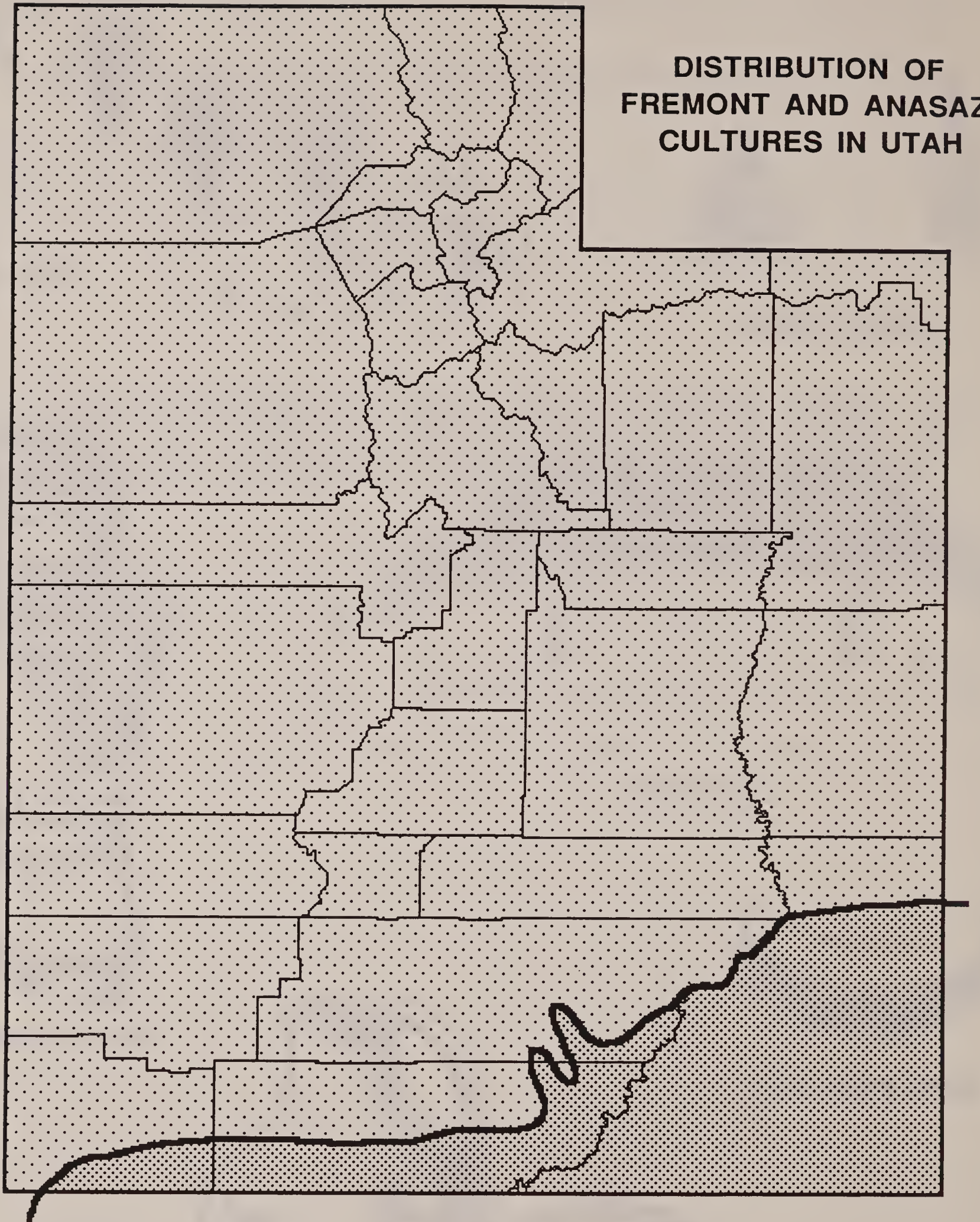


CLAY FIGURINE



CERAMICS

**DISTRIBUTION OF
FREMONT AND ANASAZI
CULTURES IN UTAH**



Fremont



Anasazi



THE ANASAZI PEOPLE Lesson 4 of Unit 2 - Utah's First People

AGE:	4th - 7th grades
SUBJECTS:	History, Anthropology
SKILLS:	Description, listening, reasoning, assimilating and integrating data
DURATION:	1 class period
CLASS SIZE:	any

Objectives: Students will 1) understand the lifeways of the Anasazi people; 2) appreciate that there are two opposing views about excavating prehistoric Indian sites; and 3) recognize that Utah contains some of the most spectacular and well-preserved prehistoric sites anywhere on earth, and that it is everyone's task to preserve them.

Method: The teacher presents content information about the Anasazi people using provided illustrations and/or the teaching kit developed by the Utah Statewide Archaeological Society.

Materials: Copycat page for each student, or transparency made from copycat page.

Vocabulary:

artifact - any object made or used by people.

ceramics - vessels made of fired clay; synonymous with pottery.

cultigen - a plant which is dependant on humans to grow and reproduce.

kiva - usually an underground structure, for ceremonial use. First built by the Anasazi people; Hopi and Rio Grande Pueblo people continue to build and use kivas today.

mano - the shaped hand-held stone used to grind grains, nuts, seeds, and mineral pigments, by moving it back and forth on a metate.

metate - a shaped stone slab used as a base upon which grains, nuts, seeds, and mineral pigments were ground with a mano.

midden - an area used for trash disposal.

perspective - point of view.

pithouse - a type of structure built partly underground, so that the earth forms all or part of the side walls.

pueblo - Spanish for "town"; applied to a type of Anasazi structure with joined rooms, built above ground, and sometimes more than one story high.

Background: The Anasazi were the contemporaries of the Fremont people, and their culture centered in the Four-corners region. In Utah, the Anasazi generally lived south of the Colorado River, and in southwestern Utah. This lesson is an overview of the Anasazi culture, and completes the story of the Formative period begun in the previous lesson.

The Anasazi are perhaps the most widely-known prehistoric group in North America. Their spectacular and well-preserved cliff homes have been publicized, photographed, written about and visited for over one hundred years. Anasazi culture captured the imaginations and interest of people worldwide, and soon Anasazi pottery and baskets were desired by European and eastern United States museums and collectors. Several expeditions to acquire these artifacts were funded by private and government sources alike through the 1920s. Descendants of the Anasazi, the Pueblo Indians of the Rio Grande River drainage and the Hopi Indians are living links to the Anasazi, retaining many aspects of culture that have their roots in prehistoric times.

Since late Anasazi sites are often well-preserved, and since archaeologists have studied the Anasazi people for over 100 years, much is known about them. In contrast to the Fremont culture, Anasazi culture appears to have been far less conservative. We see changes in their culture all through time, whereas the Fremont seem to have maintained their culture fairly unaltered during the 700 years of their occupation in Utah. The Anasazi cultural sequence is divided into broad periods using a scheme devised by archaeologist Alfred Kidder in 1927, called the Pecos Classification.

The earliest Anasazi period is called Basketmaker II. In 1927, the Archaic period was not yet defined, yet Kidder and his colleagues knew that an earlier period was logically necessary. Basketmaker I would be the equivalent of the late Archaic, although it has not been so named. Basketmaker II (BM II) Anasazi people lived from about 500 B.C. to A.D. 500. They were beginning to grow corn on a part time basis, and to live in small villages of shallow pithouses. Late in BM II times, people began to make plain gray pottery. They were still primarily hunters and gatherers.

BM II Anasazi are so named because of the beautiful baskets they made (teaching kit), typically tray or bowl shaped, but some round with narrow necks, covered with waterproofing pitch. These baskets, and most of the information we know about BM II people

come from cave sites. Dry caves have preserved items that would decay if exposed to wind, rain and sunlight. Artifacts found in BM II caves include carrying bags made of small animal skins and net, sandals, padded cradle boards for carrying infants, fur and feather robes, mats, stone and bone bead necklaces, manos and metates, bone whistles and gaming pieces, and pipes. These artifact types continue throughout Anasazi times. Dogs and possibly turkeys were domesticated by this time. BM II people stored food and other items in small stone slab-lined pits in the caves. Some of the pits became tombs for the dead, and were covered with a pole roof. Since cave sites are so dry, many BM II people buried in them became naturally mummified. The Basketmaker people were often buried with a new basket over their head, wearing unworn sandals. Mummified small dogs, presumably pets, have also been found buried in caves.

The period from A.D. 500 to about A.D. 700 is called Basketmaker III (BM III). BM II people lived in small villages of up to about 50 or 60 people, grew corn (teaching kit), beans and squash (the latter often used as gourd water containers), and made both a plain and a black-painted gray pottery (teaching kit). The homes of these people were deep pithouses, some even carved into bedrock (and the Anasazi did not have metal tools). Pithouses typically were round with an attached alcove and ventilator shaft. BM III people attached vertical ventilator shafts to their pithouses, and placed upright slabs near the entrance where the fresh air entered the subterranean home, to deflect the air currents around the room and not across the central fire hearth. BM III Anasazi still utilized wild plants and animals extensively. Corn and wild seeds and grains were ground into flour using a mano and metate (teaching kit). They hunted with the bow and arrow, and made well-crafted stone knives set in wooden handles.

After about A.D. 700, the Anasazi began to build above-ground dwellings, made of stone masonry and jacal (poles and mud). The rooms are joined together, but still only one-story high. The Spanish word for village, pueblo, has been applied to these apartment house dwellings, and this Anasazi time period is called Pueblo I (P I). Recognizable kivas made their first appearance. Kivas are subterranean ceremonial structures, the earliest ones much like pithouses. Kivas are thought to have ceremonial and ritual functions because of their similarity to the kivas of modern Pueblo and Hopi Indians. The P I Anasazi in the Blanding, Utah region made an unusual and very attractive orange pottery, some of it with red and black painted designs (San Juan Redware, teaching kit). Many other types of pottery were being made at this time too, but the orange wares were only made in southeastern Utah.

Pueblo II (P II) times, from about A.D. 900 - 1100, saw the great expansion of Anasazi territory; a warmer and slightly wetter climate at this time could be related to this expansion. Probably more people lived in southeastern Utah during P II times than do

today. The Anasazi at this time were heavily invested in farming, although they always retained some dependence on wild foods. Beginning about A.D. 800, and continuing in P II times, they built small check dams in drainages, terraced hillsides, and constructed impressive reservoirs, attempting to conserve water in an arid land. It is an "...inescapable fact that the Southwest is not, by any set of modern standards, truly suitable for gardening. Without...highly adaptive and resistant species...horticulture would not have been possible; even with these hearty plants, the aboriginal farmers were forced to develop several very specialized farming techniques, the major problem being the optimum use of scarce water...One can readily believe that the Anasazi experienced more food anxiety and more fear of famine than did their Archaic ancestors, who were less dependant upon a select few plants and the vagaries of annual rainfall" (Jennings 1978a:96-98).

People during P II times lived in small scattered farming villages, or in larger communities. Connected surface rooms, some of well-crafted masonry, were typical dwellings. Kivas are of two sizes, the more numerous being small and circular, but very large kivas were also being built. These "great kivas" are thought to have served as gathering places for large numbers of people. Recently, an extensive prehistoric road system has been discovered in southeastern Utah which appears to have connected great kivas.

Ceramics are of many shapes and painted patterns (teaching kit), the most common painted varieties being black-on-white designs. Regions developed distinctive styles of pottery, and widespread trade is evidenced by the occurrence of these regional styles in faraway places.

The Anasazi buried their dead in middens, or garbage heaps. Perhaps the following excerpt, written by a Pueblo Indian woman, explains the belief behind this practice: "Corn cobs and husks, the rinds and stalks and animal bones were not regarded by the ancient people as filth or garbage. The remains were merely resting at a midpoint in their journey back to dust. Human remains are not so different. They should rest with the bones and rinds where they all may benefit living creatures - small rodents and insects - until their return is completed. The remains of things - animals and plants, the clay and the stones - were treated with respect. Because for the ancient people all these things had spirit and being...The dead become dust, and in this becoming they are once more joined with the Mother. The ancient Pueblo people called the earth the Mother Creator of all things in the world." (Silko 1987:83-84).

The Pueblo III (P III) period saw the peak of Anasazi culture, from A.D. 1100 to 1300. Like the Fremont people to the north, the Anasazi people abandoned Utah by the end of P III times. At the beginning of the P III time period, communities were aggregating. The small scattered farming villages were abandoned, and people

were building large villages of multi-storied apartment buildings, often in cliff alcoves. The well-known and spectacular cliff dwellings of Mesa Verde were built at this time, as were the mysterious towers at Hovenweep National Monument. The function of these towers is not known. Small chips of painted plaster on wall exteriors, and beautiful painted kiva murals painted on interior kiva walls show the Anasazi people's concern for decoration. To build the cliff dwellings, enormous effort was required. Each rock was hauled into the alcove, and chipped into shape. Water usually had to be carried to the dwellings, as did everything the people used there. It remains a mystery why the Anasazi abandoned their smaller villages and invested so much in building the cliff dwelling communities, which they only occupied for about 125 years.

Social organization at this time must have been complex. The large village sites were designed and built as units, rather than the room-by-room additions characteristic of earlier villages. These sites contain several small kivas, probably associated with different clans. Planning, building, and living together in large settlements necessitates a means to work together, decision making on behalf of the entire community, and mechanisms to resolve conflicts. We also see evidence of widespread trade at this time, and the likelihood of specialization by some individuals in ceramic production and in certain roles such as spiritual leader. Both trade and specialization require some level of community coordination to accomplish.

The Anasazi continued to make beautiful pottery. They also grew and wove cotton into sashes and loose-fitting shirts. Jewelry was made of turquoise, lignite (a black stone similar to jet), bone, abalone shell, and clay.

Many people have postulated reasons for the Anasazi abandonment of the Four-corners region. A 26-year drought occurred in the latter half of the fourteenth century, a severe situation for farmers on the margins of viable farming to begin with. However, there had been droughts of that magnitude earlier, without abandonment. The drought probably contributed to the stress that moved Anasazi people out of the region, along with other factors. There is evidence that Mesa Verde was deforested by the Anasazi. People living in large villages consume enormous amounts of wood as building material and as fuel for heating and cooking. The weather patterns were also changing at this time from winter rains to heavy late summer thunderstorms. Combined with a deforested landscape, the rains resulted in increased runoff, arroyo cutting, and erosion, all of which spelled disaster for small-scale farmers. The population may also have grown beyond the support capacity of the land. These factors possibly coincided with the entrance of the ancestors of the Navajo and Apache into the area. These people were nomadic, and may have had an antagonistic relationship with the Anasazi; the cliff dwelling homes and the occurrence of fortified sites at this time lend credence to this notion. In

fact, "Anasazi" is a Navajo word meaning Ancient Enemy, sometimes translated as Ancient Ones. At any rate, most of Utah seems to have been abandoned by the Anasazi by A.D. 1300; people apparently moved south and east to the large pueblos of the Rio Grande River area, to Zuni, and to the Hopi mesas.

Anasazi artifacts are some of the most wondrous and beautiful in the ancient world, and have long been sought after by museums and collectors. Today there is an illegal black market for these artifacts, especially pottery, which can bring very high prices. Archaeologists look at artifacts as messengers of the past people who made them. Looters and collectors look at artifacts as beautiful and valuable things. Archaeologists do not keep the artifacts they study; instead, the artifacts are curated by a public museum so that the public can view the items, or use stored artifacts for research. This way, artifacts still belong to everyone. Looters and collectors, given the illegal nature of their hobby, keep artifacts as their own, not available to the public to view or study.

Anasazi ruins have been plundered for over a century. There are few ruins left with complete and undisturbed archaeological deposits. The modern-day Hopi, Zuni, and Rio Grande Pueblo Indians feel that their heritage is being stolen and destroyed when people illegally dig in sites. They, and many other Native American people, feel that the spirits of their ancestors are still part of prehistoric sites. It feels very wrong to them to see sites dug up.

Looters are usually looking for pottery, and since Anasazi people often buried pots with their dead, looters and vandals dig up many human burials in their quest for pots. They scatter the bones all about, and sometimes even take the skulls. All cultures have beliefs about proper treatment of the dead, and feel a great sense of wrong when these beliefs are violated. Indian people feel very shocked and upset when the graves of their ancestors are disturbed. They liken the situation to how non-Indian Americans might feel if Indian people went into cemeteries and dug up the bones of our dead relatives, stealing their gold teeth and other grave goods. We would be infuriated and deeply hurt if that were to happen.

Archaeologists and Native Americans agree that sites must be preserved, but they hold their beliefs for different reasons. Archaeologists know that science is constantly developing new techniques that help us learn about the past. We need to have undisturbed sites well into the future if we are to learn as much as possible about past people. Also, professional excavation is very expensive and time-consuming, so excavations are only rarely undertaken today. Archaeologists want to see sites preserved as data banks, like untapped libraries about past people.

Indian people want to see sites left undisturbed because they are places of their ancestors. There is a spirit to these places that ought not to be disturbed. Human burials, especially, should be left in peace. Indian people can feel great spiritual disharmony when they see sites excavated and human burials disturbed.

Obviously, archaeologists and Indian people can unite against site vandalism, but there have been conflicts between the two groups when archaeologists excavate sites. Archaeologists destroy sites in the process of excavating them, but they keep detailed notes, maps, drawings and photos so that the site is saved on paper. They are uncovering the past, and are able to be a source of certain kinds of information to Native Americans about their ancestors. Still, archaeologists disturb the spirit of these places, and occasionally they will uncover a human burial.

Archaeologists have many scientific methods available to them for studying human bones. From bones, we can learn a person's sex and age at time of death; certain diseases leave distinctive markings on bones, so sometimes we can learn the cause of death. Nutritional health and diet can also be determined. A very recent technique for extracting DNA from bone will allow archaeologists to trace the degree of genetic relationship between people. This technique requires that a small piece of bone be destroyed in the process. Indian people often object to the bones of their ancestors being studied. The problem becomes one of deciding between the spiritual rights of descendants versus the rights of society for information about the past. Who owns the past?

Recently, there have been examples of archaeologists and Indian people working together on this issue. Some Indian tribes have consented to having bones studied, so long as they are later returned to the tribe for reburial with proper rituals. In some circumstances, Indian tribes have requested archaeologists to remove a burial that has been disturbed by some natural means, like erosion, or has accidentally been disinterred.

In summary, it is important to realize the unique qualities of Utah's prehistoric heritage. The people who lived here prehistorically left behind a rich and intriguing record of their cultures. This archaeological record represents Native Americans' heritage. Few places in the world can boast such well-preserved and plentiful remnants of their past. However, Utah is on the verge of losing its past. Looters and vandals collecting artifacts have already severely damaged many sites. People on an outing may not realize they are destroying the past when they pick up a few artifacts from the ground surface. It all has taken its toll, and we must all work together if we are to save what is left. Never dig at archaeological sites or collect artifacts. Don't encourage others to dig sites by buying artifacts from them. Report anybody you see digging or collecting artifacts to law enforcement authorities. There's not much time left, but with everyone working

together, we can save Utah's past. Remember, it only takes one person with a shovel and ten minutes to destroy hundreds of years of prehistory.

Summary of Key Points:

- The Anasazi people lived in the Four-corners area from about 500 B.C. until A.D. 1300. The Hopi, Zuni, and Rio Grande Pueblo people are their descendants. The Anasazi cultural sequence has been defined in time periods, in Utah beginning with Basketmaker II, through Basketmaker III, Pueblo I, Pueblo II, and Pueblo III.
- Anasazi sites are spectacular and world famous, but are threatened by vandalism, illegal digging and artifact collecting. Native Americans are witnessing the destruction of their heritage when sites are destroyed and artifacts stolen.
- BM II people made baskets, gray pottery, manos and metates, had dogs and turkeys, lived in pithouses, and grew corn as well as gathering and hunting wild foods. They often buried their dead in caves, where they naturally mummified.
- BM III people lived in larger pithouse villages, grew corn, beans and squash, and made plain and painted pottery.
- P I Anasazi began to live in surface dwellings of joined rooms (pueblos). They were building kivas, and making a new variety of ceramics, an orange painted ware.
- P II times saw the great expansion of the Anasazi people, as they became intensive farmers. Great kivas became more common, linked between sites by an extensive road system. The dead were buried in middens. Many varieties of pottery were made and traded widely.
- Anasazi culture peaked during P III times. Large cliff dwellings and tower sites were built. Kivas were decorated with murals. Beautiful pottery continued to be made and traded. The Anasazi wove cotton, and made elaborate jewelry.
- By A.D. 1300, the Anasazi had abandoned Utah, for unknown reasons. A drought at this time perhaps coincided with over-population, deforestation, and the appearance of the nomadic raiding ancestors of the Navajo and Apache.
- Native Americans and archaeologists agree that archaeological sites must be preserved. However, they differ in their views when archaeologists excavate sites, and especially when they uncover human burials. Archaeologists seek information about

the past, and Native Americans claim spiritual rights to have their ancestors remain undisturbed. There are recent examples of the two groups cooperating on this issue.

Procedure: Tell the students that they are going to "time travel" to the Utah of 2,500 years ago. Refer to the timeline created for the previous unit. Remember to divide this portion of the timeline in half, so that both Anasazi and Fremont cultures can be shown. Either give each student a copy of the copycat page, or project the copycat page with an overhead projector. Present the content material to the students, emphasizing the key points. If using the teaching kit, show students the appropriate artifacts as the material is presented. After the lesson, allow them to pick up and examine the artifacts. Follow this lesson by having the assigned group illustrate the timeline created in the previous unit, and with an activity, such as a skit, role play, creative writing, or art.

Extensions: A wonderful children's book about a young Anasazi boy's life at Mesa Verde is The Coming of Gray Owl, by Ida May Hobbs, 1987, Mesa Verde Museum Association, Mesa Verde National Park, CO.

A beautifully-illustrated children's book about the Anasazi is Stephen Trimble's The Village of Blue Stone (1990, Macmillan Publishing Co., New York).

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Copycat pages' sources:

cutaway view of pithouse - Jennings 1978a:120
spindle, corrugated pot - Jennings 1978b:372
sandal - Ortiz 1979:114
rock art - Tipps and Hewitt 1989:22
mano, metate - Powell and Gumerman 1987:100
projectile point - Ortiz 1979:115
painted ceramics, bottom row - Ambler 1977:37
painted ceramics, top row - Ortiz 1979:117

1. List one thing which describes each time period of the Anasazi. Types of houses, food, way of life, or typical artifacts are possibilities to list.

Basketmaker II - baskets, gray pottery, pithouses, mostly hunters and gatherers, manos, metates, pet dogs, turkeys, mummified dead.

Basketmaker III - pithouse villages, corn, beans, squash, plain and painted pottery, bow and arrow.

Pueblo I - pueblos, kivas, orange pottery, corn, beans, squash.

Pueblo II - masonry pueblos, great kivas, many varieties of pottery, midden burials, corn, beans, squash.

Pueblo III - cliff dwellings, towers, kiva murals, many varieties of pottery, jewelry, cotton cloth, Utah abandoned at the end of this period.

2. Give a short definition of the following words.
midden - garbage heap, area for trash disposal.

kiva - underground ceremonial structure, still in use by Anasazi descendants.

mano - the handheld stone used with a metate for grinding corn and other grain.

cliff dwelling - the type of Anasazi dwelling built into cliff alcoves or caves, typical of P III times.

pueblo - the type of Anasazi dwelling that has the rooms joined and built above ground. Typical of P I and later times.

3. How do Native American people feel about people digging in the sites of their ancestors?

Generally, native Americans feel that the spirits of their ancestors have been disturbed when sites are dug. They are especially upset when human burials have been disturbed. There are some examples of Native Americans and archaeologists cooperatively investigating a site, with human bones being returned to Native Americans after archaeologists have scientifically analyzed them.

4. Name one difference between an archaeologist excavating a site and a looter digging to collect artifacts.

1) Artifacts excavated by archaeologists are kept in a public museum, for viewing or study by the public; looters keep or sale the artifacts. 2) archaeologists take careful notes and many photographs so they can reconstruct the site from the recorded information; looters simply dig sites to take perfect or whole artifacts to sell, destroying the information contained in a site.

1. List one thing which describes each time period of the Anasazi. Types of houses, food, way of life, or typical artifacts are possibilities to list.

Basketmaker II -

Basketmaker III -

Pueblo I -

Pueblo II -

Pueblo III -

2. Give a short definition of the following words.

midden -

kiva -

mano -

cliff dwelling -

pueblo -

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4. Name one difference between an archaeologist excavating a site and a looter digging to collect artifacts.

ANASAZI



SPINDLE WITH
COTTON YARN



SANDAL



ARROW POINT



CERAMICS

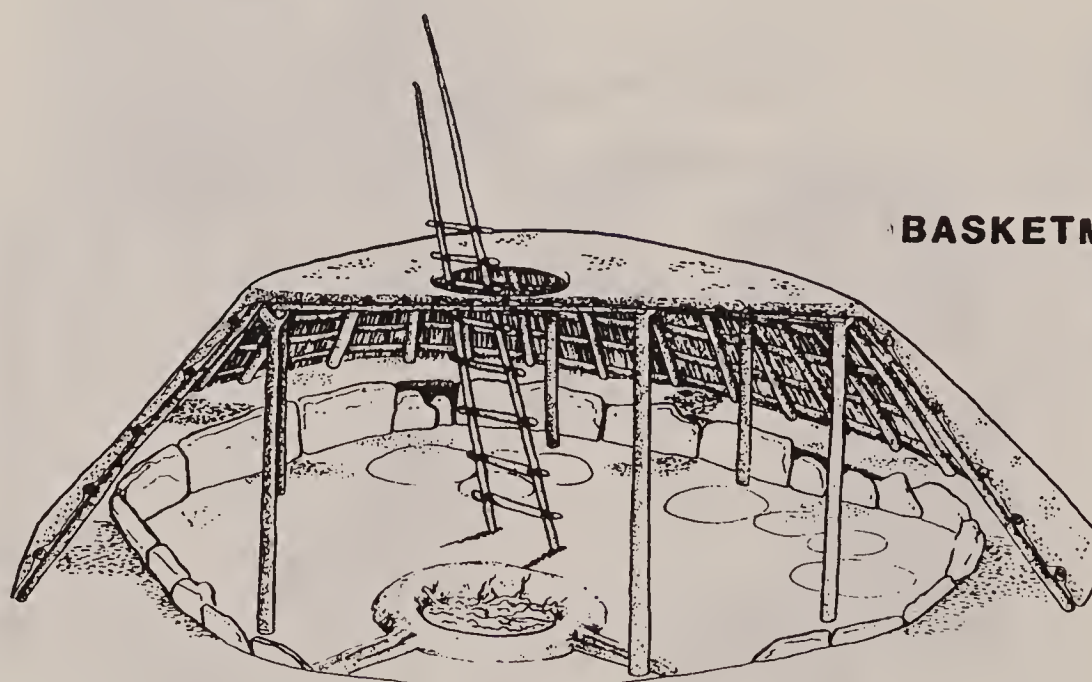
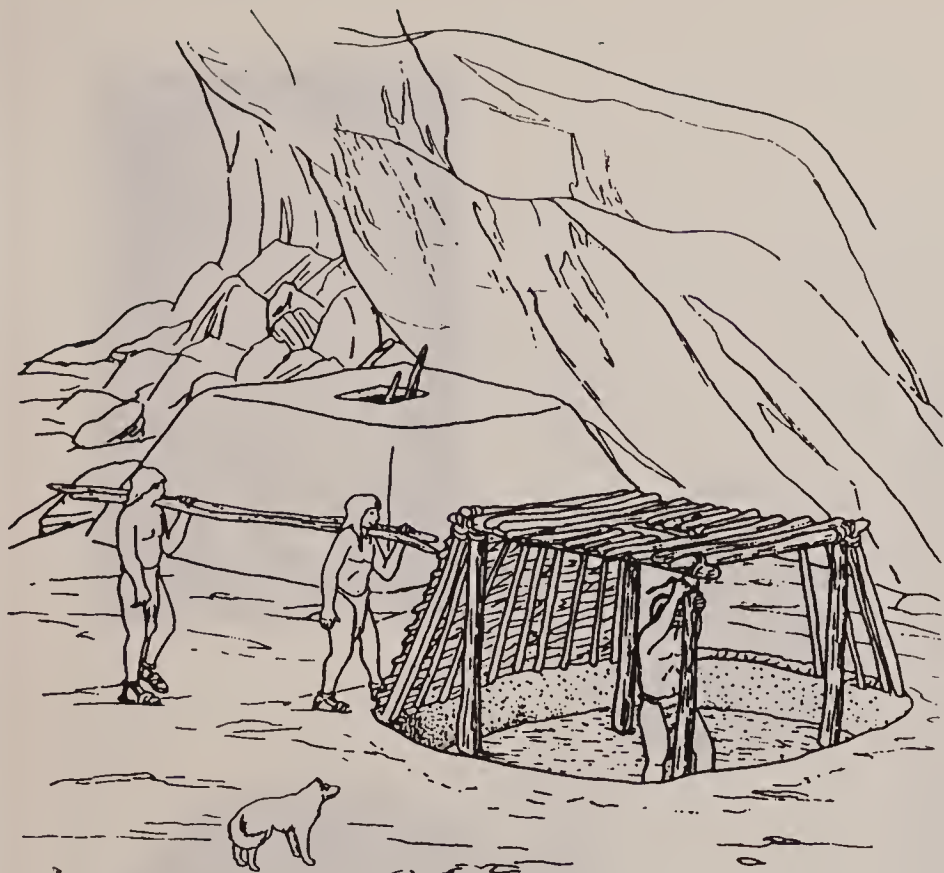


ROCK ART

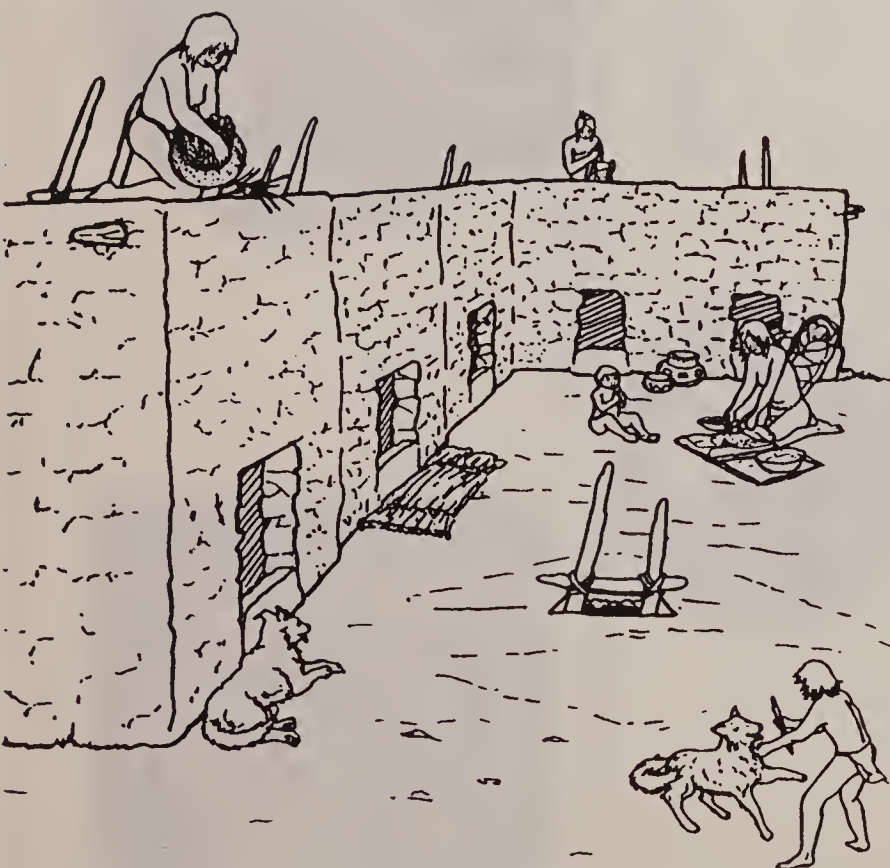


MANO AND METATE

ANASAZI HOUSES



BASKETMAKER PITHOUSE

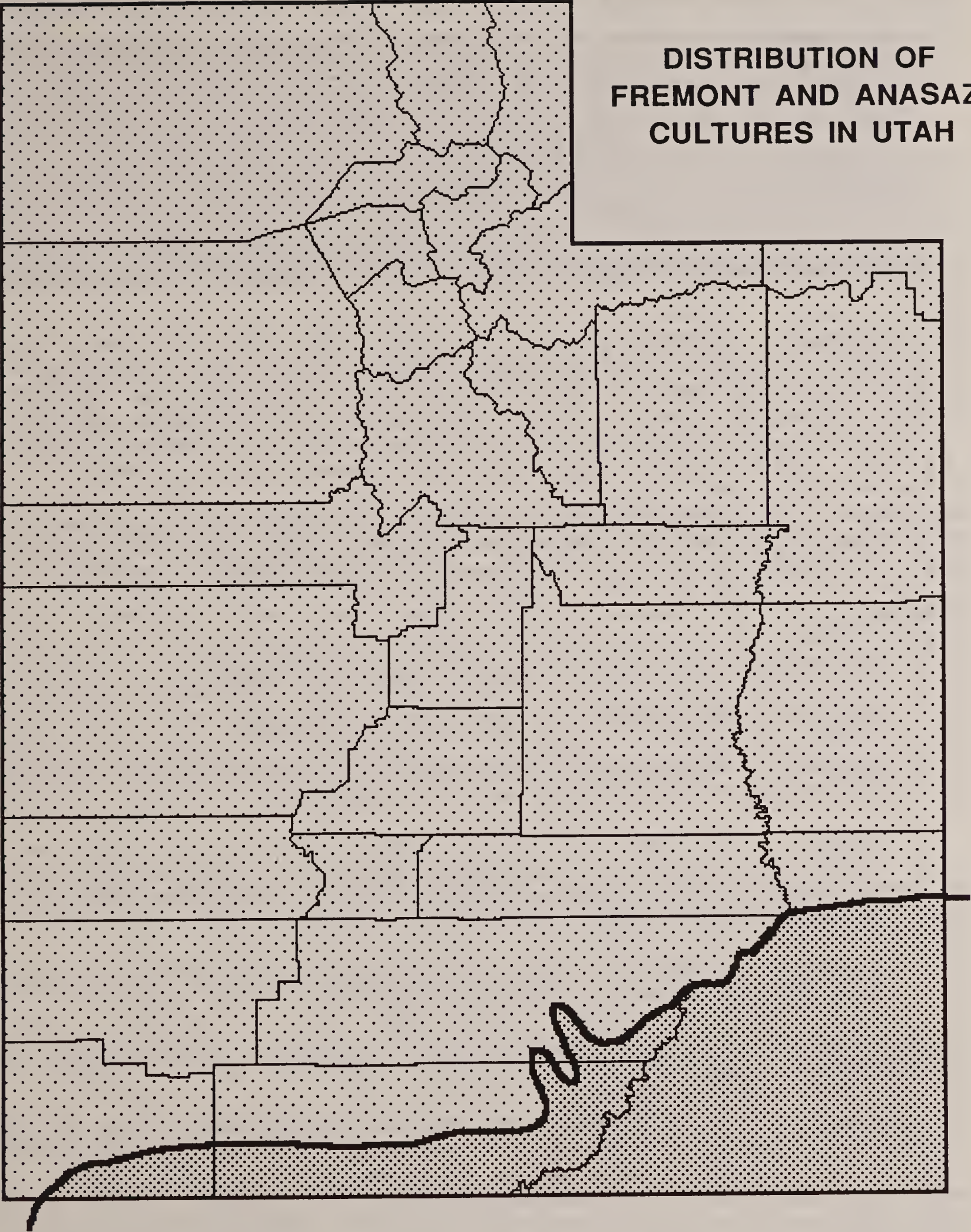


PUEBLOS AND CLIFF DWELLING



From The ANASAZI COLORING BOOK
by Jodi and Brian Freeman, 1987.
The Think Shop, Albuquerque, NM

**DISTRIBUTION OF
FREMONT AND ANASAZI
CULTURES IN UTAH**



Fremont



Anasazi



NUMIC AND NAVAJO PEOPLE Lesson 5 of Unit 2 - Utah's First People

AGE:	4th - 7th grades
SUBJECTS:	History, Anthropology
SKILLS:	Description, listening, reasoning, assimilating and integrating data
DURATION:	1 class period
CLASS SIZE:	any

Objectives: Students will 1) understand the lifeways of Numic and Navajo people from prehistory to contact with settlers; 2) understand that modern Indian groups are descendants of Utah's first people; and 3) appreciate that preservation of archaeological sites is also preservation of Native American heritage, and everyone can help with preservation efforts.

Methods: The teacher presents content information about the Numic and Navajo people, using provided illustrations and/or the teaching kit developed by the Utah Statewide Archaeological Society.

Vocabulary:

artifact - any object made or used by people.

dialect - a regional variety of a language.

hogan - the type of home built by Navajo people, usually round and built of logs with mud mortar.

Numic - The term applied to Indian people who historically spoke a derivative of the Numic language. Modern-day Northern Paiute, Southern Paiute, Goshute, Ute, and Shoshone people are descendants of Numic speakers.

wickiup - a small temporary structure built by Numic people, constructed of brush and poles and conical in shape.

Materials: Copycat page for each student, or transparency made from copycat page.

Background: This lesson concerns the people who lived in Utah after the Fremont and Anasazi. The Numic and Navajo people were the citizens of Utah when white explorers first arrived here. The time period after white contact with Native peoples is one of the most painful and complex chapters in the history of North America. This lesson does not attempt to present a complete account of this period; rather, it is a description of Numic and Navajo prehistory

as known from archaeological data and, briefly, from written accounts in historic times. The recent history of Native American people, and of their relationship with American culture, are important topics, and teachers are encouraged to teach them. It is also recommended that an Indian speaker be invited to the classroom (see extensions).

The native people encountered by Utah's first pioneers were speakers of a wide-spread language family termed Numic (NOOM-ick). Their descendants today include the Northern Paiute, Southern Paiute, Goshute, Ute, and Shoshone people. The territory occupied by these people at the time of white contact extended from the Rocky Mountains to the Sierra Mountains in northern California, from central Idaho south to the Colorado River. Their tribal boundaries were not the firm political boundaries of today, but rather were fluid, and oriented to geographical regions. The Numic language is diverse, and the different tribes speak different dialects, although speakers of one dialect typically have little difficulty understanding or learning another dialect.

The Numic people are thought to have arrived in Utah sometime after A.D. 1000. Numic migration appears to have spread in a fan-shape to the north and east from its cultural center in southeastern California, encompassing Utah, Nevada, western Colorado and Wyoming, and southern Idaho and Oregon. The direction and age of Numic migration has been reconstructed based upon two primary bodies of data, linguistic and archaeological. Linguists use a technique called glottochronology to estimate when two related languages separated from each other. They postulate that Numic people expanded into the Great Basin from the Death Valley area 1000 years ago (HDR Sciences 1980:17). Also at this time, artifacts indicative of the Numic people, especially a brown-ware pottery, began to appear in southern Nevada, occurring slightly later in Utah.

The Fremont people occupied Utah from A.D. 500 until about A.D. 1200. The coincidence of the demise of the recognizable Fremont culture with the postulated arrival of Numic people implies that one of three scenarios occurred: 1) the Fremont and the Numic people intermarried and became one culture; 2) the Numic successfully competed with the Fremont, causing them to leave the area or perish; or 3) the Fremont left Utah for reasons not related to the arrival of Numic people. Some modern Numic descendants think that the Fremont were their direct ancestors. In any case, by A.D. 1300, Fremont material culture (artifacts) was no longer present, and the Numic people were established in Utah.

Numic people lived a lifestyle much like that of the Archaic folk, who lived in Utah from about 8000 B.C. until A.D. 500. They were hunters and gatherers, relying on wild plants and animals for subsistence. Many sites occupied by Numic people are adjacent to

freshwater lakes and rivers. They ate fish and other marsh resources, including waterfowl and water-loving plants. They also gathered seeds (teaching kit) and hunted game animals such as deer, bison, elk, mountain sheep, antelope, rabbits and other small mammals. Insects (Mormon crickets, grasshoppers [teaching kit]) were gathered and eaten when abundant. Numic people hunted with the bow and arrow, and made Desert Side-notched arrow points (teaching kit). Some Shoshone groups, and the Goshute of Deep Creek in western Utah were known in historic times to have planted seeds from wild plants, but were not full-time farmers.

In the arid West wild plants and animals are seldom abundant in one place, so Numic people lived a nomadic lifestyle. They were experts in plant and animal locations and seasons of availability. The nomadic pattern of Indian people recorded by early Utah white explorers and pioneers was almost certainly the prehistoric pattern as well. In winter, several family groups would gather, typically in mountain foothills or river valleys to establish a winter village. They subsisted primarily on foods they had gathered and stored. Winter was traditionally a time of "...extended storytelling, when elders conveyed the knowledge and lore of the tribal culture to others" (HDR Sciences 1980:37). Late winter could be a time of famine, especially hard on the elderly and the very young.

In spring, people would disperse in small family bands to gather the first green plants and to fish. Seed-gathering and hunting occurred throughout the summer and fall. Summer social gatherings were for both socializing and for exchanging information about the availability of resources. Excess seeds would be stored, and meat was dried. During the late fall, when pine nuts ripened, several family groups would meet to harvest pine nuts, which were stored as winter food. People undoubtedly returned year after year to favorable locations, although variation in weather patterns and plant and animal productivity required them to be adaptable to changing conditions.

Even today, pine nut gathering by Numic descendants is a time of festivity and tradition. Family groups take outings to harvest the delicious and nutritious pine nut, although today some of the crop is sold.

Numic people were skilled basketmakers, and today the tradition lives on among Shoshone, Paiute and Ute people. They manufactured winnowing trays, loosely woven fan-shaped trays for parching and winnowing wild seeds and nuts. They also made large carrying baskets for collecting wild foods, cradleboards, and water jugs, among other types. In addition, Numic people manufactured a coarse brown-ware pottery (teaching kit).

People traveled on foot, and only late in their history did some Numic people acquire horses. Horses were not native to North

America after the Pleistocene epoch, the last species of native horses becoming extinct about 12,000 years ago. Native Americans acquired horses from the Spanish, when Juan de Oñate established Spanish rule in Mexico, in 1597. He imported hundreds of horses, and also took Pueblo Indian people as slave herdsmen. Indian people gained possession of horses through escaped slaves, and capture of both Spanish and feral horses. By 1650, Ute people were using horses as pack animals, but were not riding them (Shimkin 1986:517). By 1830, most Utah Numic people had horses, except for the Goshute and Southern Paiute. The arid lands and seed gathering economy of those people were not compatible with horse grazing.

Like many technological changes, the consequences of acquiring horses were far-reaching. People became much more mobile, and much more efficient at hunting large game, especially bison. Trade and contact between formerly distant groups became easier. Warfare increased as people competed for horses and grazing lands. Even houses changed. Previously, Numic people lived in small brush shelters called wickiups (wick-E-ups). With the acquisition of horses, hides and poles could be hauled easily and people began to live in tepees. Political relations between Indian groups also changed. The unmounted Goshute and Southern Paiute, for example, were subject to slave raids by both the Spanish and mounted Indians (Malouf and Findlay 1986:503).

From about 1776 to 1840, Anglo-American explorers and trappers interacted with Utah's Native Americans, but had little impact on their cultures. After about 1840 though, Numic people began to encounter American culture more frequently, with increasingly devastating effects to their traditional lifeways. Pioneers moving west passed through Utah over several emigrant trails. The large herds of cattle, oxen and horses they brought with them severely depleted the grasses upon which some Numic groups depended for edible seed. Settlement by Mormon pioneers in 1847 displaced people from areas they had traditionally used. White people also brought with them many diseases Native Americans had never encountered before, such as smallpox, influenza, and measles. Indian people had no immunity to these diseases, and they died by the thousands. Entire families and significant numbers of a tribe's population were decimated.

The history of the Navajo people in Utah probably begins sometime after A.D. 1500. By the early 1600s, the Spanish were referring to the Navajo people as Apaches de Nabajo. The Navajo and the Apache are closely related people, both speaking a variety of the Athabascan language. It appears that the Navajo people arrived in the Southwest from the north, but the exact route is uncertain.

The Navajo interacted extensively with the Pueblo people in New Mexico and Arizona, and they learned pottery making and weaving from them. The Spanish recorded that the Navajo farmed small plots of maize and other plants, but they also remained hunters (Brugge

1986), using the bow and arrow. Hogans are the traditional homes of Navajo people, and are built to symbolize their spiritual connection to the earth. The hogan door, for instance, always faces east to meet the rising sun. Even today, when many people live in modern homes, hogans are built nearby for ceremonial use. Hogans have been built in a number of ways over the centuries, but are typically round and built of wooden beams with mud mortar between the beams.

By the end of the 1700s, Navajo people were herding sheep acquired from the Spanish (Powell and Gumerman 1987:119). After being forcibly sequestered to a reservation in 1868, the Navajo began weaving the beautiful rugs for which they are noted today. The Navajo Nation is the largest tribe in the United States today, with over 160,000 members.

Rock art was created by both Navajo and Numic people. Figures often depict subjects introduced by American or Spanish culture, such as trains, horses, saddles and tack, priests, and people dressed in Western clothing.

Between 1860 and 1870, hostilities between native Indian people and white settlers escalated, resulting in wars, raids, and massacres. The U.S. Army retaliated, and began segregating Indian people onto reservations, beginning with the Uinta Reservation in 1865 for Ute people, today called the Uinta and Ouray reservation. (see map for distribution of historic tribes and reservations). Today, in addition to the Ute Reservation, Utah Indian reservations include that of the Skull Valley Goshute; scattered holdings of the Southern Paiute; the Navajo Nation; the Northwest Band of Shoshone; and the Confederate Tribes of Goshute Reservations. The White Mesa Ute are a recognized tribe in Utah, but they hold no reservation lands.

The arrival of white settlers was devastating to traditional Indian cultures. Today, we are at most five generations removed from the genocide and displacement of native peoples. It is a credit to the spirit of Indian people that their cultural identity survived at all, given that up to half of their population died of disease and warfare, and their traditional lifeways were eliminated. While certainly influenced by modern American culture, many native peoples retain aspects of their traditional belief system and religion, artistic expression, language, child-rearing practices, kinship system, and world view. Today, Utah's citizens are fortunate to have within the state the rich and long heritage of Indian people. The opportunity to understand other cultures, cultures with deep connections to the very land we now live upon, is close at hand.

Summary of Key Points:

- The Native peoples encountered by Utah settlers were the Numic-speaking Ute, Paiute, Goshute, and Shoshone people, and the Athabaskan-speaking Navajo people.
- Numic people first appear in Utah about A.D. 1000, and may have displaced the Fremont people. Numic people lived a nomadic hunting and gathering lifestyle.
- Navajo people arrived in Utah after A.D. 1500, and became herdsman.
- Utah Indian people acquired the horse about A.D. 1650, with far-reaching consequences. Housing, trade, inter-tribal warfare, and hunting are some aspects of culture that changed.
- Hostilities between Indian people and white settlers reached a peak between 1860 and 1870, after which Indian reservations were established.
- Today there are seven Indian tribes in Utah (Confederate Tribes of Goshute at Ibapah, Skull Valley Band of Goshute, Northwest Band of Shoshone, Uinta and Ouray Ute, White Mesa Ute, Navajo, Southern Paiute). Indian people embody a long and rich heritage, some of which is represented in the archaeological record. Preserving archaeological sites is also preserving Native American heritage.

Procedure: Tell the students that they are going to "time travel" to the Utah of 800 years ago. Refer to the timeline created for the previous unit. Either give each student a copy of the copycat page, or project the copycat page with an overhead projector. Present the content material to the students, emphasizing the key points. If using the teaching kit, show students the appropriate artifacts as the material is presented. After the lesson, allow them to pick up and examine the artifacts. Follow this lesson by having the assigned group illustrate the timeline created in the previous unit, and with an activity, such as a skit, role play, creative writing, or art.

Extensions: Invite a Native American to speak to the class. Contact local tribal offices, the talent bank for ethnic minority folk artists maintained by the Utah State Office of Education (Sylvia, 538-7640), or Wil Numkena, Indian Education, Utah State Office of Education (538-7500).

Mapping Utah Place Names (Lesson 7, Unit 3) uses many Numic and Navajo place names. Making Cordage (Lesson 4, Unit 3) teaches students an art of the Numic people.

Many children's stories have been written about Indian people, and some use Indian stories. This lesson could be enriched by reading these stories to the class, or by recommending them to the students. The Utah State Board of Education, Indian Advisory Committee, has published American Indians of Utah: A Guide for Teachers, an annotated guide to education materials.

Published stories from Utah Indian tribes include:

Grandfather's Story of Navajo Monsters (Richard Red Hawk, 1988, Sierra Oaks Publishing Company); The Way It Was Told (Uintah-Ouray Ute Tribe, 1977, University of Utah, Salt Lake City); Why the North Star Stands Still (Paiute stories by William R. Palmer, 1973, Zion Natural History Association, Springdale, Utah); and Newe Natekwinappah: Shoshoni Stories and Dictionary (Wick R. Miller, 1972, Anthropological Papers No. 94, University of Utah, Salt Lake City).

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Copycat page sources:

wickiup - Jennings 1978b:160
arrow point - IMACS manual
bow and arrow - D'Azevedo 1986:372
baskets - D'Azevedo 1986:709, 711, 713
hogan - D'Azevedo 1986:530
Navajo rug - D'Azevedo 1986:594
ceramic - Jennings 1978a:238

1) Imagine that you are a Ute boy or girl, and it is 1800. Your family group has just traded for your first horses. Name three things about your lifestyle that will change.

houses - tepees are now possible to transport; contact with other groups easier; trade with other groups is easier; warfare between groups increased because of competition for grazing lands; hunting became more efficient.

2) Place an '1' beside the things that Numic people are known for, and a '2' beside the things that Navajo people are known for.

hogan 2

wickiup 1

tepee 1

winnowing tray 1

Desert side-notched arrowpoints 1

wild seeds 1

sheep 2

3) Write a short description of your daily life, as if you were a Navajo or a Numic person 400 years ago. Describe your food, your house, and some of the tools you would use.

Numic people lived in wickiups (they did not live in tepees until after they had the horse). They lived on wild foods, particularly seeds and pine nuts. They are noted for their fine and varied basketry and a brown ware pottery. They hunted using bows and arrows and small arrowpoints. Some Numic people grew food on a part-time basis.

Navajo people lived in hogans. They grew corn and other foods, and raised sheep, used both for food and for wool. Wool was woven into beautiful rugs. Navajo people made pottery and also hunted with the bow and arrow.

QUIZ - Unit 2, Lesson 5

Name _____

1) Imagine that you are a Ute boy or girl, and it is 1800. Your family group has just traded for your first horses. Name three things about your lifestyle that will change.

2) Place an '1' beside the things that Numic people are known for, and a '2' beside the things that Navajo people are known for.

hogan ____

wickiup ____

tepee ____

winnowing tray ____

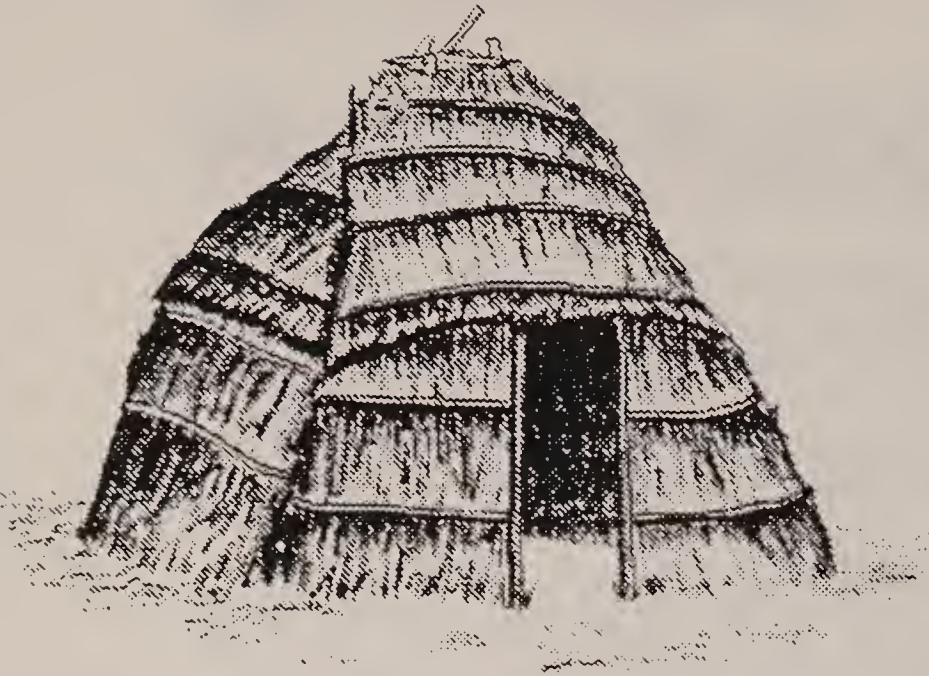
Desert side-notched arrowpoints ____

wild seeds ____

sheep ____

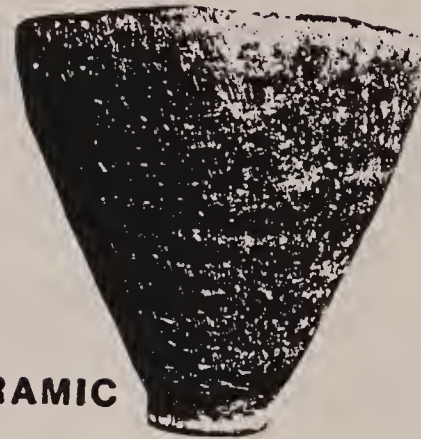
3) Write a short description of your daily life, as if you were a Navajo or a Numic person 300 years ago. Describe your food, your house, and some of the tools you would use.

NUMIC AND NAVAJO

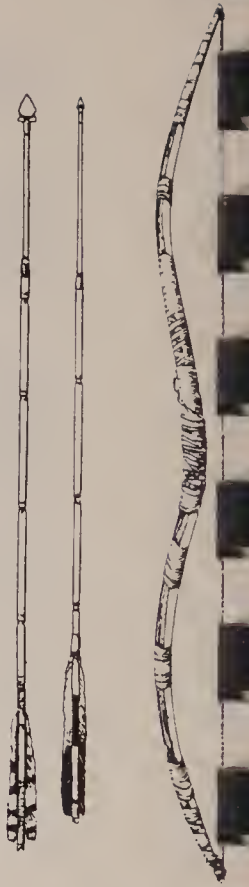


WICKIUP

ARROW POINT



CERAMIC



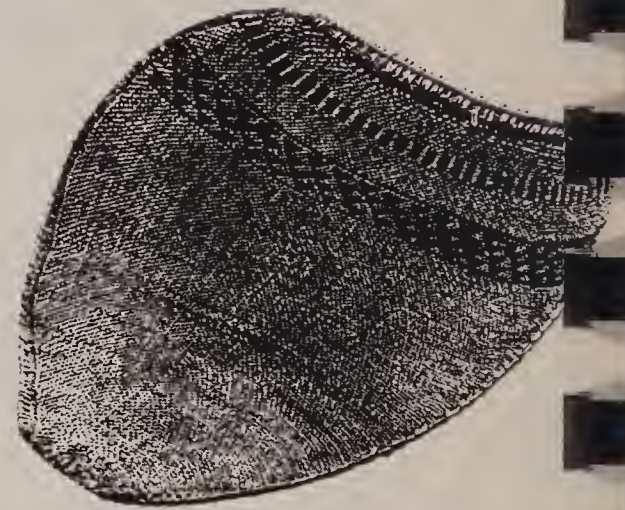
BOW AND ARROW



CARRYING BASKET



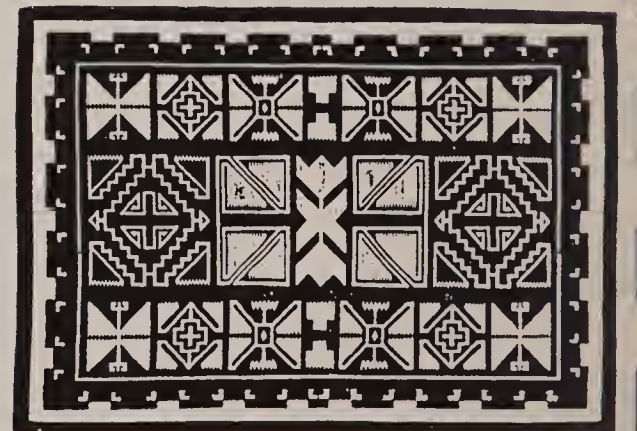
WATER BOTTLE BASKET



WINNOWING TRAY

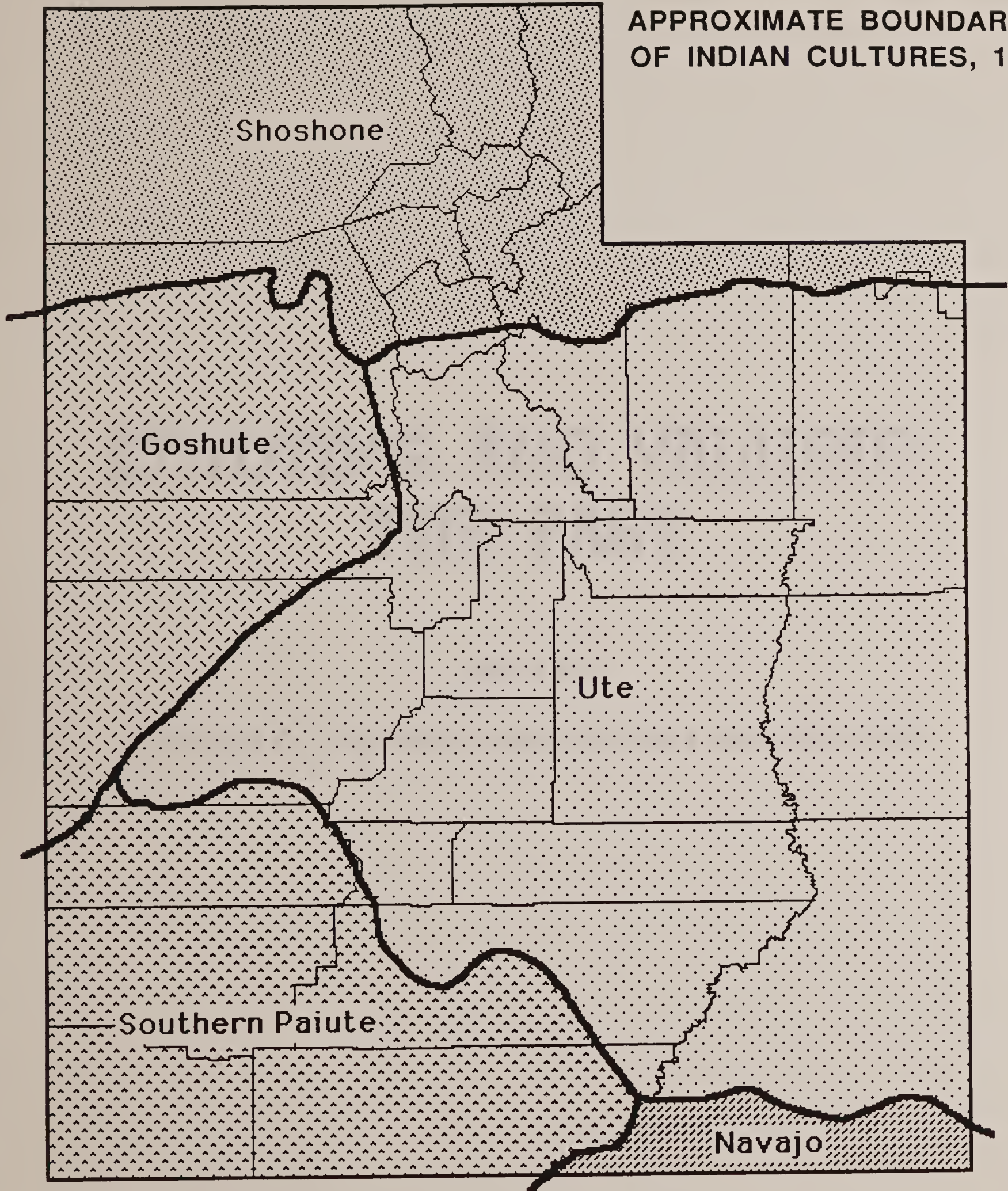


NAVAJO HOGAN



NAVAJO RUG

**APPROXIMATE BOUNDARIES
OF INDIAN CULTURES, 1840**



Source: Atlas of Utah, 1981

STUDYING AND VALUING THE PAST

UNIT 3 OF

INTRIGUE OF THE PAST: INVESTIGATING ARCHAEOLOGY

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Unit 3 - Studying and Valuing the Past

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AGE:	4th to 7th grades
SUBJECTS:	Archaeology, Science, Citizenship
SKILLS:	Classification, inference, observation, scientific inquiry, cooperative learning
DURATION:	1 class period
CLASS SIZE:	any, work groups of 4-5

Objectives: Students will be able to 1) classify objects in order to answer specific questions; 2) make inferences about human behavior by classifying objects; and 3) articulate why it is important that sites be undisturbed so that archaeologists can classify artifacts and make inferences about the culture of past people.

Method: After discussing the principle of classification, small groups of students classify everyday objects. Next they classify the contents of their desks with a behavioral question in mind. Students learn how and why archaeologists classify artifacts. They classify Anasazi artifacts to answer questions about human behavior.

Materials: Doohickey kits (about two dozen familiar objects such as bolts, string, rocks, paper clips, and cloth); copycat page for each student; Archaeology Teaching Kit (optional).

Vocabulary:

artifact - any object made or used by people.

inference - a conclusion derived from facts or premises.

behavioral inference - conclusions about human behavior; archaeologists make inferences about the behavior of past people based on objects.

Background: A basic element of thinking is classification. We place objects and situations into conceptual categories in order to make sense of the world, so we don't have to respond to each novel object or situation as a completely new experience. We classify things almost automatically. For example, when a child sees a kitten for the first time, he or she will usually know that it is a variety of cat, because the child already knows the category 'cat' and the kitten meets the criterion for being included in the category 'cat'. A tent, cave, trailer, or brick house can be classified together as types of shelters.

Items can belong to several categories. 'Kitten' and 'puppy' could be classified as 'baby animals', for example. The number and kinds of categories into which objects could be classified are infinite, but some very general categories are metal, stone, man, woman, child, animal, car, house, and tree.

Objects left by prehistoric and historic people form the archaeological data base. In order to understand archaeology and prehistory, students must understand the significance of objects and their context (the relationship objects have to each other and where they are found). It is from these data that behavioral inferences are made. But first, archaeologists classify objects into categories.

The classification process is generally governed by a question designed to examine human behavior. What specifically do we want to learn about past people? For example, if we want to learn how much income a pioneer family had to spend on luxury items, we would divide the relevant artifacts into two classes - essential items and non-essential items. If a large percentage of objects in the archaeological record are non-essential items, we would infer that this family had an income large enough to purchase many luxury items.

Artifacts may contain very simple and straight-forward information such as the relative amount of time needed to make the object. For instance, Paleo-Indian Folsom style projectile points are usually well manufactured while Numic Desert Side-Notch points are often less well-made. As weapons, they functioned equally well. Perhaps the Numic people thought of projectile points as merely utilitarian, devoting their creative energies to other objects and activities, while to Paleo-Indians the projectile point was their most important tool. Similarly, some Americans think of their car as just a way to get around while to others it is their most prized possession. Much more complicated information, such as aesthetic appreciation of the maker or owners may also be available from artifacts. For example, why did the Anasazi paint some of their pottery but not all of it? Was it because different potters made it or was it because painted pottery was used for different purposes than unpainted pottery?

An example of a classification system for Anasazi artifacts:

1. pottery
 - A. painted pottery
 - B. plain pottery
2. stone tools
 - A. projectile points (arrowheads)
 - B. knives
3. organic remains
 - A. food remains (corn cobs, squash seeds, animal bones)
 - B. charcoal

Procedure:

Divide the students into groups of 4 or 5 and give each group a Doohickey Kit. Have each group organize the objects into categories, using their own classification scheme. When everyone is finished, ask each group to explain their scheme; what criterion did they use to place an object in a certain category: shape, color, type of material, other. Ask the class how their scheme would have been different if certain items or classes of items (say, all red things) were removed.

Next, have students classify the contents of their desks. Items could be categorized as follows:

1. Writing instruments
 - A. pencils
 - B. crayons
2. Paper
3. Books
4. Miscellaneous
 - A. gum
 - B. money
 - C. trash

Students now classify the contents of a classmate's desk with a specific question about their behavior in mind, such as "Is this person a saver or a throw-awayer?" What are the two absolutely essential categories to answer this question? The new classification system might look like this:

- 1.. Trash
2. Non-trash

To answer the research question, ask which category contains the largest percentage of objects. Trash or non-trash? Discuss with the students differing ideas about what constitutes "trash". Would their conclusion about their classmate be the same if some items, such as all paper and books, had been removed from the desk before the exercise? No, their behavioral inference would change because the data its based on has changed.

Explain to the students that archaeologists classify artifacts so they can organize their data, ask questions of it, and begin to make inferences about human behavior. Discuss how archaeologists sometimes have a problem with their data because people dig sites and collect artifacts. Vandals are usually digging for pottery. Just as students were limited in making classifications and inferences if items were removed from the Doohickey kits or their classmate's desk, archaeologists are limited in what they can learn from a site which vandals have dug. It is very important to the study of the past that sites be left undisturbed.

Classify Anasazi artifacts using the attached cut-apart copycat page. (If the Archaeology Teaching Kit is available, groups of students can take turns classifying the artifacts). Have students group the artifacts in two or three different ways to answer specific behavioral questions, such as:

- A. What was the diet of the Anasazi?
- B. How many different raw materials did they use to make artifacts?
- C. How many different ways did they decorate their pottery?
- d. Make up your own question.

Use the examples of classification systems on the answer sheet to assist students with their classification schemes. Their results do not need to match the answer sheet exactly.

Point out to the students that objects move from one category to another, depending upon the question asked. For example, if the goal was to classify objects which were used to store food, then all of the painted and plain pottery would be in the same category. However, if we wanted to know if there was a difference in the function of types of pottery, then we would classify the plain and painted wares separately. Perhaps plain ware was for everyday use, and the painted ware was used for special occasions or functions.

We can further refine our classification scheme in order to ask different questions. How many styles of painted pottery are there? Are there different designs because different potters painted them, or because they were the general styles at the time?

Summarize the lesson, emphasizing that classification is a basic skill used by scientists to study any phenomenon. Archaeologists classify artifacts into categories that help them make inferences about the behavior of past people. They need the cooperation of everyone in preserving sites. Never dig at a site or collect any artifacts, and report anyone you see digging or collecting to law enforcement authorities.

Evaluation: Use either the Archaeology Teaching Kit artifacts, or the copycat page to administer the quiz.

Extension: Broken Pots: Classification (Lesson 12 of Unit 3) is a classification activity using modern ceramics.

1. Why do we classify objects?

To make sense of the world so we don't have to respond each new object as a completely new experience.

2. Why do archaeologists classify artifacts?

Archaeologists classify artifacts in order to begin to make inferences about human behavior, based on research questions.

3. Outline the categories of artifacts you would use to help you answer the following questions.

- a. What did the Anasazi eat?

Food Remains

Vegetable

Corn

Beans

Animal

Bone Fragments

- b. How many different raw materials did the Anasazi use to make their artifacts?

Stone

Bone

Plant Fiber (basketry)

Clay

Shell

Leather

- c. How many different ways did the Anasazi decorate their pottery?

Painted Pottery

Checkerboard

Lines

Dots

Shapes

Plain Pottery

Corrugated Pottery (if the teaching kit is used)

- d. _____ (Your own question).

QUIZ Lesson 1, Unit 3

Name _____

1. Why do we classify objects?
2. Why do archaeologists classify artifacts?
3. Outline the categories of artifacts you would use to help you answer the following questions.
 - a. What did the Anasazi eat?
 - b. How many different raw materials did the Anasazi use to make their artifacts?
 - c. How many different ways did the Anasazi decorate their pottery?
 - d. _____ (Your own question)



1



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3



4



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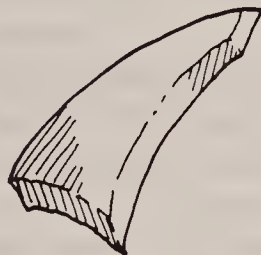
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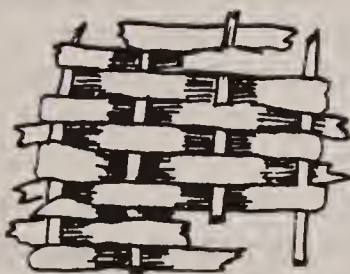
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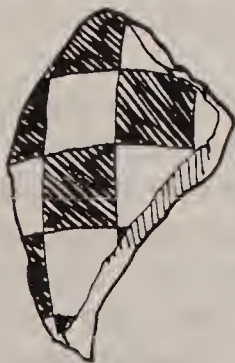
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ARCHAEOLOGY AND TREE-RING DATING Lesson 2 of Unit 3 - Studying and Valuing the Past

Adapted from Date a Tree, by Barbara Gronemann, 1986, Southwest Learning Sources and the Arizona Archaeological Council

AGE:	4th - 12th grades
SUBJECTS:	Science, Biology, Mathematics, History, Archaeology and Geography
SKILLS:	Application, observation-inference, computation, comparing similarities and differences, analysis
DURATION:	1 class period
CLASS SIZE:	any

Objectives: Students will be able to 1) apply principals of dendrochronology to determine a tree's age and to recognize climatic variation; 2) analyze and experience how archaeologists use tree rings to accurately date archaeological remains and study past climates; and 3) understand the importance of leaving archaeological sites undisturbed.

Method: Students will be given either a wood sample (Tree Cookie) or will use copycat pages of tree core drawings. They observe and count tree rings, and place tree cores from prehistoric dwellings in chronological order using a Master Sequence.

Materials: Copycat pages, scissors, glue or Scotch tape.

Vocabulary:

dendrochronology - determining the age of a tree by counting its rings; the study of tree ring dating.

increment borer - an instrument used to remove a core sample from a tree.

Background: Dendrochronology (den-droh-cruh-NOL-uh-jee), also called tree-ring dating, is based upon the fact that trees grow by adding an outer layer, usually one per year. When looking at a cross-section of a tree trunk, these yearly layers appear as light and dark rings of varying widths. The layer next to the bark is the most recent yearly growth, and the center of the first year of growth. One pair of light and dark rings results from one year's growth. The light colored section is the spring and summer growth when the tree has a lot of sap. As the weather cools, and the tree slows its growth rate, the cells become smaller and thicker-walled. Finally, the sap stops flowing and the tree ceases to grow during

the winter, forming a smooth dark ring. By counting the dark rings, the age of a tree can be known if the cross-section of the trunk is complete.

In the arid West, trees seldom have sufficient moisture to grow to their maximum potential each year. The width of the tree-rings varies with the growing conditions of that year. For instance, higher rainfall and a longer growing season produces a wider ring than during years of low rainfall and prolonged cold. Tree-rings can thus tell us about year-to-year climatic conditions in the region the tree grows in. The tree-ring patterns have never been found to repeat in exactly the same way.

Dendrochronology was first studied in 1904 by Dr. Andrew E. Douglass, an astronomer at the University of Arizona. He was trying to analyze climate, and he soon noticed that the trees showed the same patterns of ring widths, because they had all experienced the same climatic conditions. In order to study climate further back in time, Douglass analyzed wood from prehistoric Indian ruins in the Southwest. He used a "bridging" method, called cross-dating, to do this.

First, he looked at trees recently cut, so that he knew the exact year that the tree added its last growth ring. By counting inward and subtracting the number of rings from the year the tree was cut, the year that tree started to grow could be calculated. Another piece of wood whose cutting year is not known can have its cutting year determined by matching the patterns of tree-ring widths with the patterns on the piece of wood whose cutting year is known. Say the known cutting date for a tree is 1980, and the tree was 50 years old when cut. Another tree was also 50 years old when cut, and it shows a portion of the same pattern of tree-ring widths as the known tree. Its outer ring matches the twentieth ring from the outside on the known tree. Therefore, the second tree was cut twenty years earlier than the first one, so it was cut in 1960. By continually matching the ring patterns with older and older pieces of wood, a sequence of tree-ring patterns is now extended as far back as 8700 years in some places.

Dendrochronology is particularly valuable to archaeologists since it can tell us very precisely how old a site is. Many ruins still have wood preserved in their walls and roofs, and even charcoal from a burned structure or a cooking fire can sometimes show clear tree-ring patterns. Archaeologists are also very interested in knowing about past climate since it influenced where people lived, what kinds of foods they grew, and what wild plants and animals were available to them. The study of tree-rings for climatic data is called dendroclimatology.

Rather than remove a beam from an ancient structure, dendrochronologists use an increment borer, a small power-driven sort of drill which removes a thin tube of wood from the beam.

This bore will leave a hole in the beam that is only about the size of a soda straw. They also use this method of core removal on living trees so the tree does not have to be cut down.

Bristlecone pines, which grow on windswept mountain tops, have been tremendously valuable to dendrochronologists in establishing the sequence since they can live to be more than 4600 years old! These trees are a living library of climatic information. The increment borer lets us "read the tree's pages" without harming the tree.

A master sequence of ring patterns is prepared for different regions, since rainfall and temperatures, and hence tree-ring widths, vary from place to place. The master sequence is represented on a slip of paper with vertical lines drawn on it, which match tree-rings of a known date. The dendrochronologist makes a graph of the ring patterns for the particular piece of wood she is studying, then slides it along the master sequence until the patterns match. The cutting date of the piece of wood is now known.

By studying many pieces of wood from a prehistoric village, archaeologists can learn about such things as the village growth history, remodeling, site abandonment and re-use. When people returned to a village that had been abandoned for several years, they would repair, replace, and sometimes remodel the buildings, using new wood. The year of their return can be read from the tree-rings of the new wood.

The study of tree-rings is important to people living today, too. Long-term climatic patterns are being studied, informing us about the frequency of such events as drought and severe winters. We could be better prepared for these events if it could be predicted when they would occur, based upon their long-term frequency pattern.

Wooden beams, building materials, and charcoal provide a wealth of information about past cultures. However, today people sometimes destroy this evidence when they visit Indian ruins. Ancient houses have been pulled apart and the beams used in a campfire. Illegal digging in ruins can also move beams and charcoal from their original location, and then archaeologists cannot tell their context (the other things they were part of or used with). It is very important to our knowledge about the past that we visit sites with care, and not disturb or destroy anything that is there.

Procedure: Explain the principles and uses of tree-ring dating. Give each student a copy of The Stump copycat page. Assume the tree was cut in 1987. Have the students answer the questions on the page.

Give each student a copy of the "Be a Dendrochronologist" copycat page. It depicts cross-sections of three beams from different

archaeological sites in Utah. Have students cut out the core samples, like a dendrochronologist taking a core sample. The students match their core samples to the Bristlecone Pine master sequence. Glue or tape the samples from each core onto the master sequence to see how the beams overlap and to date and place them in chronological order.

After students have dated the beams and put them in order, ask them to make some observations about the climate at these different sites. What might have been the weather conditions at that time? How would the weather have effected farmers?

Evaluation: Students complete Page 2 of "Be a Dendrochronologist!" and turn it in for evaluation.

Extension: Instead of using The Stump copycat page teachers can use "Tree Cookies," which are polished cross-sections of tree stumps and limbs. Tree Cookies are available for loan, free of charge, from the U. S. Forest Service in Ogden, Utah. (801-625-5348).

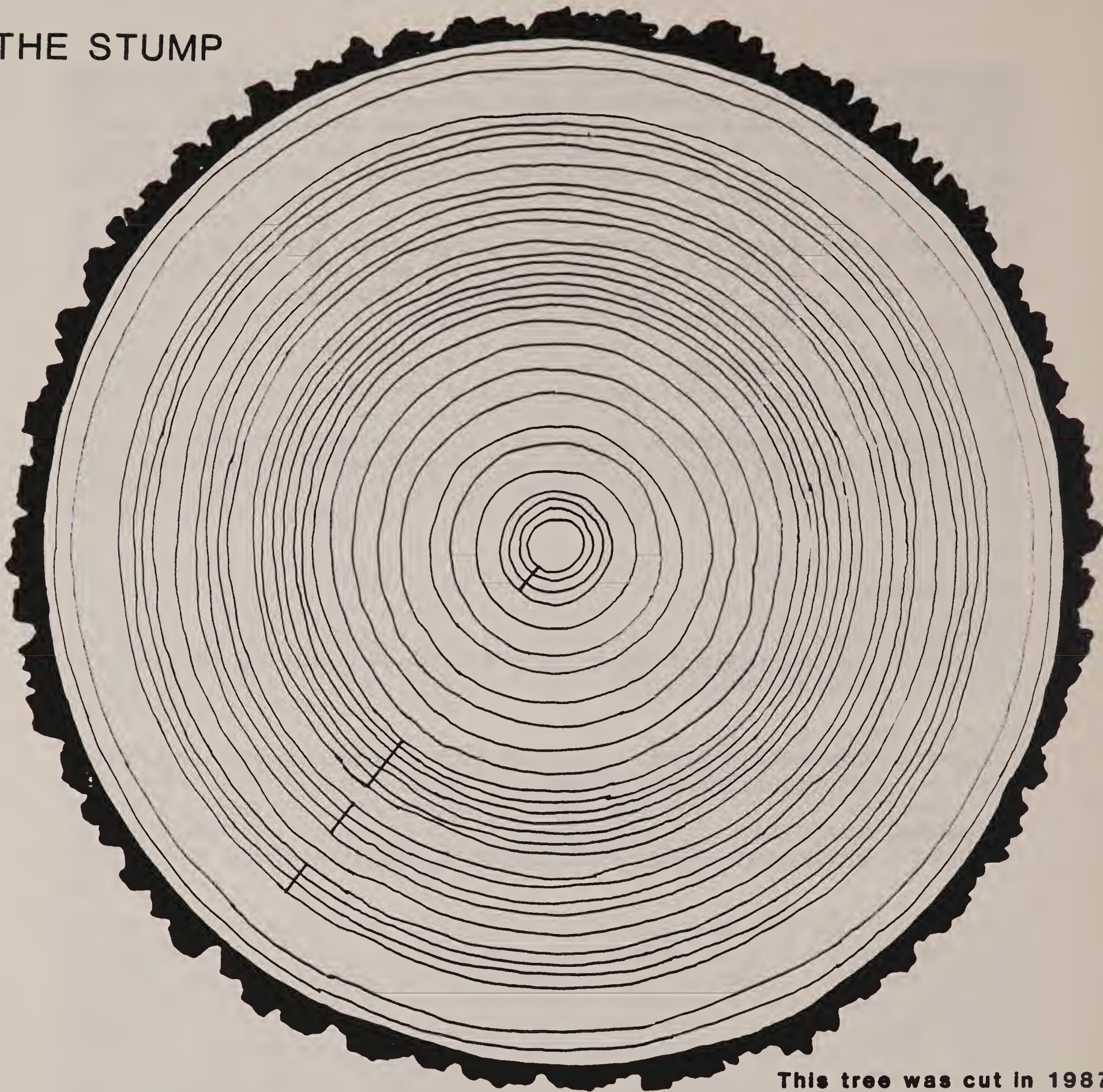
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THE STUMP



This tree was cut in 1987

How old is the tree? 30 years old

What year did the tree start growing? 1957

Find the ring that grew the year you were born. Was it a wet or dry year?

Between what years was there less rainfall? 1958-1960; 1970-1975; 1976-1979; 1982-1984

In what year was there the most rainfall? 1985

What can a tree tell us?

1. Name two things archaeologists can learn about a site from tree-rings.

Climate and the years the site was occupied.

2. How is the tree-ring record affected if prehistoric people used wood beams from older sites when building new homes?
It could be skewed. However, if archaeologists find that some beams date well before the others at a site, they would suspect that the early beams had been re-used.

3. Why are Bristlecone Pine trees so important for studying tree-rings?

They are the oldest living things on earth, and provide a master sequence of tree-ring patterns that dates back over 4000 years.

4. What happens to the archaeological record if someone removes a beam or even places it somewhere else on a site?

Removing beams removes information about the site's date and climate. Moving beams around confuses the record, and archaeologists cannot then tell which room the dated beam belongs to.

Refer to Page 1 of your "Be a Dendrochronologist" worksheets:

Which beam is the oldest? B

Which beam is the youngest? C

Which beams overlap? A & B

How old was Tree A when it was cut? 13 years

Tree B? 13

Tree C? 13

What year did Tree A start growing? A.D. 972

Tree B? A.D. 963

Tree C? A.D. 988

What year was Tree A cut? A.D. 984

Tree B? A.D. 974

Tree C A.D. 1000

What can you say about the climate where the trees grew?

Tree A:

During which years was there less rainfall? A.D. 975-977; 982-984

List one wet year 978, 980, 981

Tree B:

During which years was there less rainfall? 965-966; 969-971

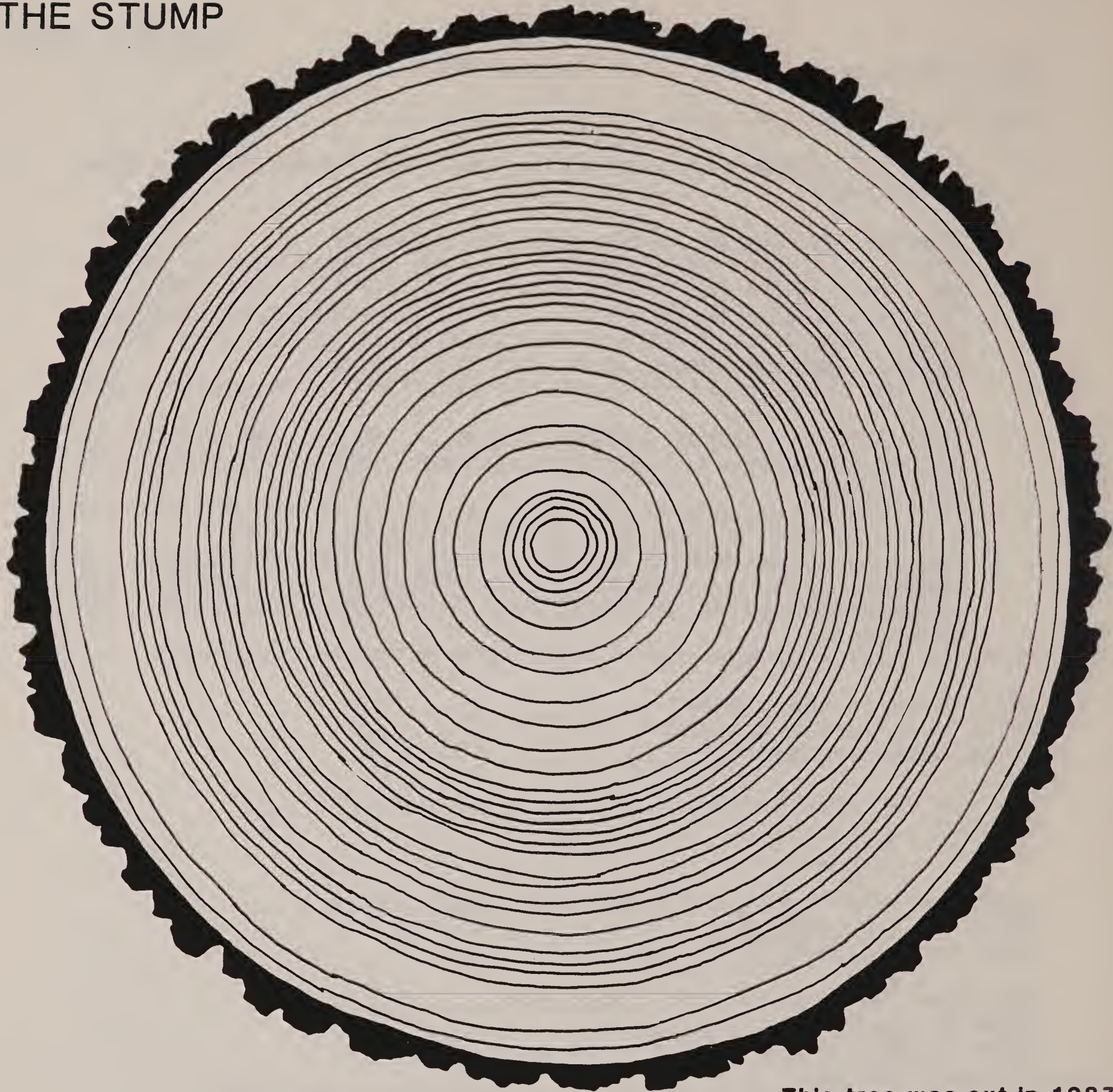
List one wet year 986, 972, 973, 974

Tree C:

During which years was there less rainfall? 992-993

List one wet year 991, 994, 995, 997, 998, 999

THE STUMP



This tree was cut in 1987

How old is the tree? _____

What year did the tree start growing? _____

Find the ring that grew the year you were born. Was it a wet or dry year? _____

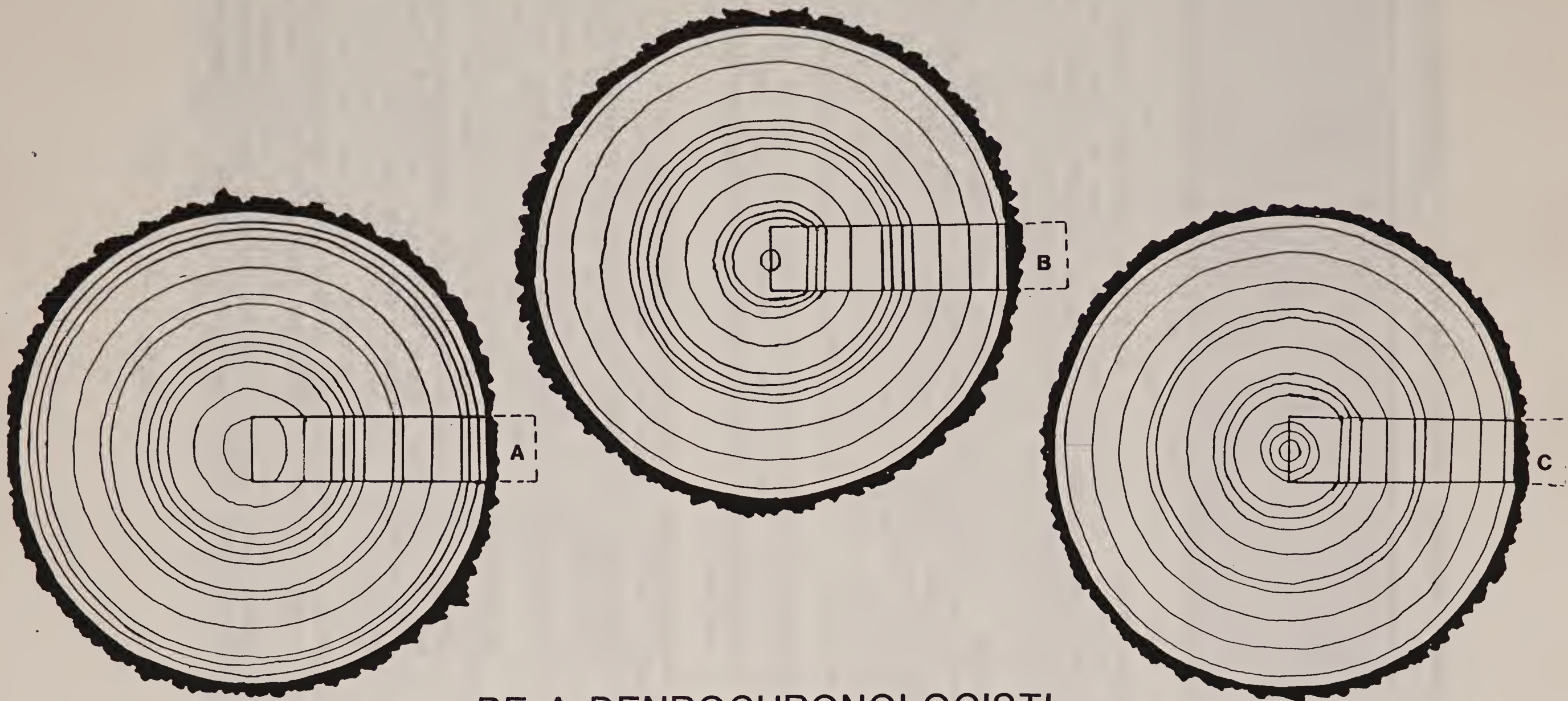
Between what years was there less rainfall? _____

In what year was there the most rainfall? _____

Bristlecone Pine Master Sequence

Date A.D. 962

Date A.D. 1000



BE A DENROCHRONOLOGIST!

POLLEN ANALYSIS Lesson 3 of Unit 3 - Studying and Valuing the Past

AGE:	4th - 7th grades, modify for upper grades
SUBJECTS:	Science, Botany, Archaeology, Climatology
SKILLS:	Application, problem solving, discussion, discovery
DURATION:	1 class period
CLASS SIZE:	any

Objectives: Students will be able to 1) name characteristics of pollen; 2) understand how pollen analysis is applied to the study of past climates and human behavior; and 3) appreciate that archaeological sites must be preserved intact in order to apply pollen analysis.

Method: After lessons about plant structure, present information about the study of pollen and the kinds of questions it can answer about past climates and peoples' lifeways. Lead students to discover applications of pollen analysis to answer research questions.

Materials: Colored picture of pollen grains.

Vocabulary:

climatology - the study of climates and their long-term patterns.

coprolite - fossilized human feces.

cultigen - a plant which is dependant on humans to grow and reproduce.

palynology - the study of pollen grains.

palynologist - a scientist who studies pollen grains.

pollen - a powdery substance produced by flowering plants. Pollen is the male genetic material, which pollinates (fertilizes) the female part of the flower to produce fertile seeds.

Background: Palynology is the study of pollen grains and spores. "The higher plants...produce pollen grains containing the male genetic material...The lower plants or cryptogams (plants without true flowers or seeds) produce spores which contain the necessary genetic material for the growth of an independent generation of

plants" (Bradley 1985:289). In this discussion, 'pollen' will be used in a general sense to mean both true pollen grains and spores.

Pollen has four very valuable features which make it useful for study (Moore and Webb 1978:1). Most importantly, it preserves very well over enormous time spans if it is buried and maintained in fairly constant conditions of humidity, temperature, and acidity. Pollen grain walls are made of a complex compound (sporopollenin), which is very resistant to decay. Pollen grains have been found preserved in rock millions of years old. This is not to say that the pollen grain is still viable to fertilize the female plant complement, but rather that the distinctive shape of the grains is still discernable. Other plant parts (leaves, flowers, stems) are far less likely to be preserved.

Secondly, pollen grains, because of their very small size, tend to be carried in air currents. This results in their wide dispersal, and the likelihood that representatives of many kinds of plant pollen will become included in sediments that palynologists study. Related to this, plants produce abundant amounts of pollen, increasing the likelihood of its inclusion in sediments. Pollen becomes deposited in sediments by settling out of the air onto the ground surface where it may become buried by blowing sand or other sediments. Pollen may also alight on the surface of a body of water, settle through the water column, and become incorporated into lakebed sediments.

Finally, different kinds of plants produce different kinds of pollen grains. The distinctiveness of pollen grains allows identification to (usually) the genus level, and in some cases, to the species level.

Pollen is recovered from sediments through a laboratory procedure using several harsh chemicals. The process is termed "pollen extraction", and essentially involves dissolving the sediments, leaving the pollen which is then placed on a microscope slide and sealed with a glass cover. Using microscopes to magnify the grains 400 to 1000 times, palynologists count and identify the pollen. They are then ready to begin interpreting their results.

Pollen analysis has several useful applications. Beekeepers examine pollen in their honey to determine from which plants the bees are gathering nectar. Allergists and microbiologists study pollen in the atmosphere, and apply their findings to health science and to disease transmission by spores. The most frequent applications of pollen analysis, however, concern tracing plant histories, studying past climate and its long-term cycles, and determining which plants were used by prehistoric people.

Modern plant communities typically do not have a long history, but are "simply temporary aggregations of species developed under certain historical and climatic factors" (Birk in Bradley 1985:

318). By studying the plant communities of an area over time, we can learn about plant succession, factors that limit plant growth, and about changing climate. Any given plant species has specific requirements for temperature and moisture. Climatic change results in a change in the kinds of plants which can grow in a certain area, and this plant community change is reflected in the pollen record. By analyzing the pollen, palynologists can know which plants were growing in a given area at a particular time. Since we know the range of tolerances plants have for moisture and temperature, we can infer what the climate had to have been to support the plants represented by the pollen record.

To study the climatic changes of the Pleistocene (the geologic epoch dating from 1.5 million years to 10,000 years ago) and the Holocene (10,000 years ago to the present), palynologists core through lake sediments, to extract a column of the sediments (often in plastic pipe about 4 inches in diameter). This core contains a sample of the lakebed, including the pollen that has settled there over thousands of years, layer upon layer, the most recent being at the top of the core. Back in the laboratory, small samples of the sediments are taken at regular intervals, say every 10 centimeters along the core. The samples are processed to extract the pollen, which then is counted and identified using a microscope. Palynologists plot the frequencies of pollen types to see the rise and decline of plant species over time. While it is a very complex proposition to recreate past climates, pollen analysis allows a means to study past broad patterns. Understanding longterm climatic patterns has direct usefulness to us today. As concern about global warming grows, we need to be able to separate natural climatic cycles from human-caused changes, so we can understand the magnitude of the problem.

Weather patterns on a local level are directly relevant to us today as well. For example, palynologists are beginning to see patterns in long- and short-term droughts in the Southwest. As population in the Southwest grows, and as water becomes more scarce, such information could be invaluable to planners and farmers.

Archaeologists rely upon palynology to inform them about past climates and the plants and animals available to prehistoric people. When archaeologists are excavating a site occupied by prehistoric people, they regularly take pollen samples, small bags of sediment, which are sealed and sent to a palynologist. These samples help reconstruct climate on a very local scale, important because temperature and moisture can vary dramatically over short distances. In addition, archaeological pollen samples can tell us if people were growing their own food, or relying upon wild plants and animals. A deliberately cultivated plant is called a cultigen. Such samples can sometimes even help determine the function of a room. Rooms without artifacts or interior features are often interpreted to be storage rooms. An abundance of corn pollen within the dirt floor would substantiate this interpretation.

It is important to realize that sites that have been dug up by looters and vandals looking for artifacts have lost much of their potential to tell us about past people and past climates. Looters digging in sediments mix layers from earlier times with those from later times. They also expose the previously sealed layers to contamination with modern pollen, rendering them useless for climatic reconstruction. People digging in sites don't even realize they are destroying this fascinating evidence of the past, but they are. It is against the law to dig sites or collect artifacts on Public Lands. Don't encourage others to dig sites by buying artifacts from them. It is up to everyone to preserve our past. It could mean our future.

Pollen has other uses besides providing clues about past climates and past people. Pollen is a very nutritious food, high in protein. Corn pollen is fed to livestock as a dietary supplement, and some people claim pollen has medicinal healing effects (Stanley 1971). Prehistoric people also used pollen as a food. Cattails produce abundant pollen, and Fremont people apparently used it as a flour (Madsen 1979). Coprolites found in Great Basin caves show that Archaic people were eating the pollen of cattails, grasses, cottonwood trees, and various other plants.

Pollen has a special spiritual meaning to Indian people. Corn pollen represents the power of fertility and reproduction, and is an element in many rituals of the Hopi, Zuni, and Rio Grande Pueblo people (Waters 1972:162). To the Navajo people, pollen of "corn and other plants is very important in maintaining the proper relationship to the Holy People. In old-fashioned households the day still begins with the sprinkling of pollen from one of the little bags and a brief murmured prayer" (Kluckhohn and Leighton 1974:203).

Procedure: After teaching lessons about plant characteristics, tell the students that they are going to learn an actual application of studying pollen. Present background information about pollen and pollen analysis. Then guide students to discover the kinds of questions pollen analysis can answer. Conclude the lesson by telling students that pollen analysis can only be applied to archaeological questions if everybody helps to preserve archaeological sites.

Evaluation: Ask the following questions, either as class discussion topics, or as a quiz. Evaluate students' comprehension of the material by their degree of reasoning ability and participation in the discussion, or correct quiz answers.

1. What would you know about the past climate of (your town) if pollen from an archaeological site 1000 years old showed that coconut palms and pineapples had grown here? (In Utah, no such evidence has been recovered, and this situation is presented to illustrate the inference process).

The climate would have to have been warmer and moister than today, with a moderate climate all year round. We know this from examining the climate where coconut palms and pineapples grow today.

2. A man accused of murdering another person has been apprehended, but he says he has never been in the forest where the body was found. He claims that he was in the desert at the time of the murder, and he is wearing the same muddy clothes he had on then. He says that he got muddy when trying to remove his truck from a mudhole in a jeep trail. How might you use pollen analysis to help discover where he really was?

A situation similar to this actually happened. "A man was arrested and charged with the murder of another man while on a journey along the Danube near Vienna; however no body could be found. Pollen analysis of a soil sample from the arrested man's shoes revealed much pine and alder pollen...Fortunately only one area was known along the Danube where pine and alder grew together...so the suspect was confronted with this fact. He was so shocked at the deduction that he admitted the crime and the precise location where he had hidden the body [Moore and Webb 1978:7]).

3. You know of an ancient Indian village near your home which is well preserved. Citizens of your town are trying to decide whether they should build a very expensive reservoir, to conserve water in case of another drought. One evening, you are out for a walk and meet some people who are talking about going up to the Indian village to dig for artifacts. What might you tell them is wrong with doing that? What kind of information important to your town could they be destroying?

In digging the site, they destroy information about past people and about past climates. It is also against the law to dig sites on public lands. The site could be a storehouse of information about past climates, information which could be very useful to the citizens of the town as they consider the reservoir. They could learn the pattern and duration of droughts in the area over hundreds of years through analyzing pollen contained in the site's deposits.

Extension: Have the students bring in a sample of vegetation, or a small potted plant, that is represented on the color pollen picture. Examples might include pine, grass, cattail, or Mormon tea. Have them either glue their sample, or draw an illustration of it, on a sheet of paper, and then draw the corresponding pollen grain beside it. This extension could be used to introduce scientific illustration.

In the spring of the year, students could collect pollen from flowering plants. Most pollen is yellow or orange, but other colors occur. Poppies have purplish pollen, for example. Shake a flower over paper coated with white glue to collect a sample.

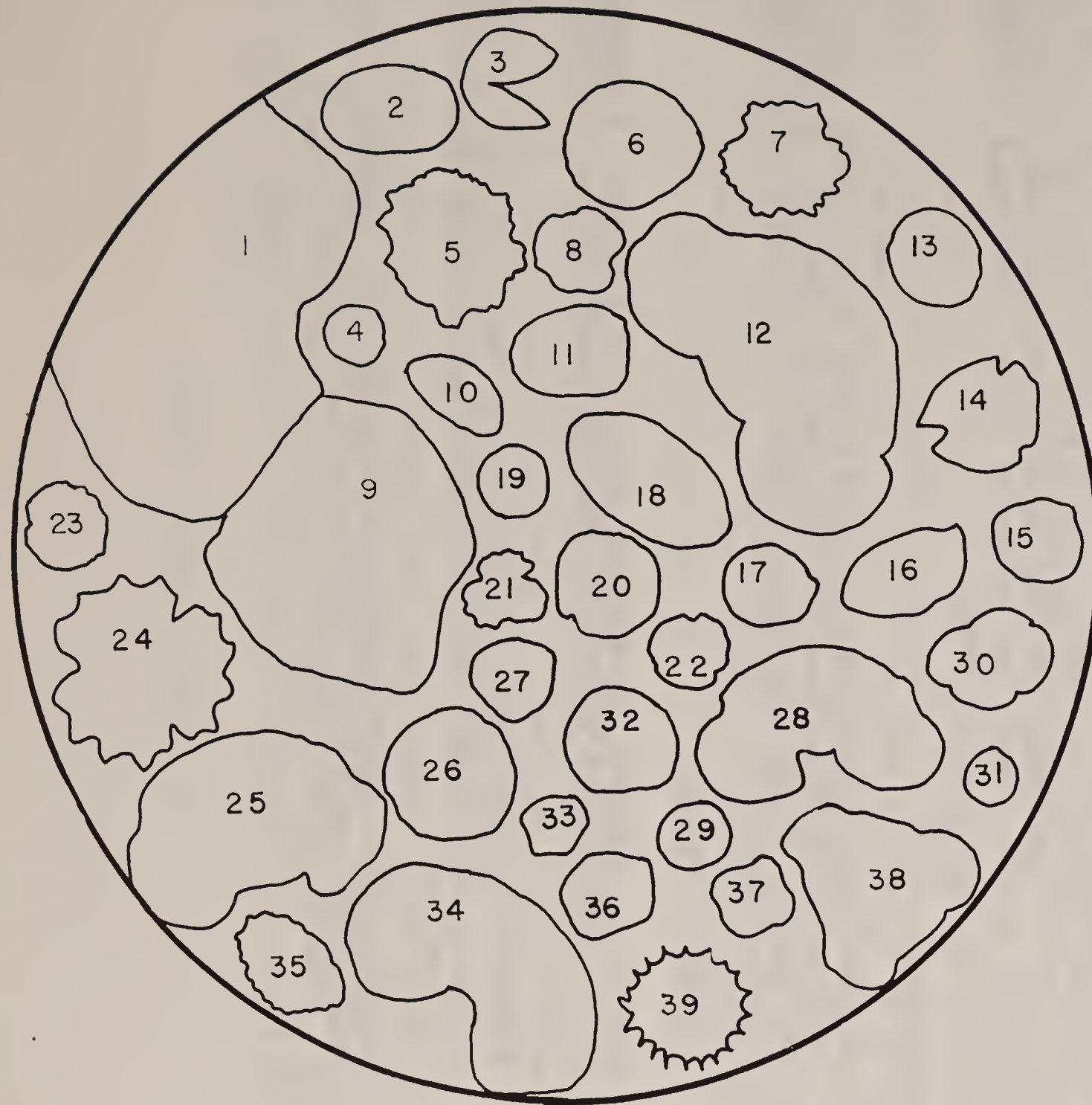
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Color Photocopy in Teacher's Booklet

KEY TO POLLEN GRAINS



COMMON NAME

1. Pine
2. Buckwheat
3. Juniper
4. Currant
5. Sunflower family
6. Grass
7. Groundsel
8. Mustard
9. Douglas fir
10. Parsley family
11. Sedge
12. Fir
13. Cottonwood
14. Mountain mahogany
15. Cattail
16. Iris
17. Hickory
18. Mormon tea
19. Goosefoot family
20. Oak
21. Sunflower family
22. Sunflower family
23. Phlox
24. Sunflower family
25. Pine
26. Unidentified
27. Birch
28. Pine
29. Indian wheat
30. Cattail
31. Willow
32. Sunflower family
33. Currant
34. Pine
35. Indian Pond Lily
36. Alder
37. Sagebrush
38. Evening primrose
39. Sunflower family

SCIENTIFIC NAME

- Pinus
- Eriogonum
- Cupressaceae
- Ribes
- Linguliflorae
- Gramineae
- Senecio
- Cruciferae
- Pseudotsuga
- Umbelliferae
- Cyperaceae
- Abies
- Populus
- Cercocarpus
- Typha augustifolia
- Iris
- Carya
- Ephedra
- Chenopodiaceae
- Quercus
- long-spine Compositae
- Ambrosia-type Compositae
- Phlox
- Compositae
- Pinus
- unidentified
- Betula
- Pinus
- Plantago
- Typha latifolia
- Salix
- Linguliflorae
- Ribes
- Pinus
- Nuphar
- Alnus
- aberrant Artemisia
- Gaura
- Compositae

MAKING CORDAGE Lesson 4 of Unit 3 - Studying and Valuing the Past

AGE:	4th - 7th grades
SUBJECTS:	Anthropology, Art, History, and Technology
SKILLS:	Comparing similarities and differences, eye/hand coordination, and cooperative learning
DURATION:	1 class period
CLASS SIZE:	any, work groups of 4-5 students

Objectives: Students will be able to 1) make rope (cordage) from fibers; 2) experience the technique and skill needed for a survival art of a historical people; and 3) appreciate the knowledge, time, and skill required in survival technology by people like the ancestors of modern Paiute Indians.

Method: The teacher discusses technology and culture, and explains that cordage was critical to the Paiute people's survival. After a demonstration by the teacher of how to make cordage from either purchased or natural fibers, students work in small groups and make cordage.

Materials: One spool of hemp rope (about 1/2 inch in diameter) obtainable from a craft or hardware shop. Milkweed or Dogbane plant stocks can also be used.

Vocabulary:

Paiute - an large Indian tribe whose traditional territory included the Great Basin of California, Nevada, Oregon, Utah and Idaho. Their descendants in Utah are the Southern Paiute Indian people.

cordage - rope.

fiber - a slender threadlike strand or string. A number of fibers can form a single substance: muscle fiber, plant fiber etc.

sinew - animal tendon prepared to use as cord or thread; Indian people used sinew to fasten stone tools to handles or dart shafts.

technology - the technique or means for making or doing something, often associated with tool making.

Background: Modern-day Paiutes are the descendants of people who lived in the Great Basin for approximately the past one-thousand years. Traditionally, the Paiute were very skilled and well-adapted to living in the Great Basin. They used tools made only from natural materials: bone, antler, sinew, and hide from animals, plant fiber, clay, stone and mineral. They were a hunting and gathering people, very knowledgeable about the Great Basin's varied environments, seasons and resources. In the fall, Paiute people gathered pine nuts in the pinyon forests of the Basin's many mountain ranges. Springs and marshes provided an abundance of fish, water fowl, game, plant food, and building materials. Today, many Paiutes take great pride in their traditions and still participate in their ancestors' relationship to the Great Basin. For example, many Paiutes journey to the mountains to collect pinyon pine nuts to sell and to use for food and in ceremonies.

Cordage was an integral part of the Paiute peoples' survival. "Lacking nails, bolts, and screws the Paiutes tied their world together. They tied their wood and willows in bundles to carry them into camp; they tied small game onto their waist bands; they tied tules to make boats, and cattails to make houses; they tied babies in baskets, and arrowheads to shafts. They used cords in place of buttons and safety pins, to make traps, to catch fish and hang them to dry. In addition to the tough rope of cattails and sagebrush bark, they made strong string of sinew and human hair. They also used supple young willow withes for tying. But, the finest cordage of all was made of Indian hemp, or dogbane." (Wheat 1967:55)

It is interesting to contrast the technologies of different peoples. Comparing the Paiute technology to that of modern-day Americans for example, we can clearly see two different strategies at work. The Paiutes had a commonly-held understanding of their environment and the skills necessary for survival. They were generalists, and nearly everyone knew how to do and make nearly everything they needed. Modern people have more specialized skills, knowledge and roles. For instance, we have computers and cars, yet the vast majority of us could not produce a computer or car.

Procedure: Define technology for the students. Contrast technologies from our modern culture with prehistoric cultures, pointing out that while early peoples' survival technologies are often depicted as "primitive" or naive, most modern Americans would be at a loss to survive in a natural environment.

Read aloud the passage about how the Paiute tied their world together and how important cordage making was to them. Demonstrate how to make cordage from fibers, then break the class into groups of 4-5 students. Give each student about 15" of fibers. Assist each group, asking students who readily learned the procedure to help other students.

To prepare the fibers, cut the purchased rope into 15" sections. Untwist the rope and pull the fibers straight. If using natural fibers, cut year-old dead stalks of Milkweed or Dogbane. Carefully break open the stalks and strip the fiber away. Use it in the same way as the purchased rope.

To make cordage, first rub the hemp or fibers between both palms to remove debris. Separate two long strands of several fibers each from the 15" rope or plant section, starting from one end.

Hold one end of Strand A and one end of Strand B together, side-by-side, in your left hand between your forefinger and thumb (if right-handed, visa versa if left-handed). Pick up Strand A between your right forefinger and thumb, and twirl the strand away from your body (clockwise).

Take the twisted Strand A and bring it toward your body, over and under Strand B.

Hold strands A and B between your left forefinger and thumb about where you crossed A over B. Repeat the twirling and crossing sequence: pick up Strand B, twirl it away from your body, and cross it over and under Strand A.

Continue these steps. The twirling in one direction and crossing in another direction forms an interlocking pattern like that of a machine-made rope. If the cordage looks all twisted in the same direction, then the locking twist is not taking place, and usually the strands are being twirled in the wrong direction.

Left-handed people will reverse the directions of twirling and crossing. They twirl the strands toward their bodies, and cross the strands under then over.

The process of making cordage is difficult to describe, and it sounds more complicated than it really is. Try it; its surprisingly easy.

Evaluation: Evaluate students' efforts to make cordage. Have students write a creative story about living in the Great Basin without modern technology, including five things they would have to know how to do in order to survive.

Extension: Discuss how technology changes culture. Suggested examples are North American Indians acquiring horses (in Lesson 5, Unit 2) and the cultural changes which take place when hunters and gatherers become settled farmers (in Lesson 3, Unit 2).

References:

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Nevada Press, Reno, Nevada.

MEASURING POTS Lesson 5 of Unit 3 - Studying and Valuing the Past

AGE:	7th - 12th grades
SUBJECTS:	Mathematics, Archaeology
SKILLS:	Calculating, problem solving
DURATION:	30 minutes
CLASS SIZE:	any

Objectives: Students will be able to 1) calculate circumference from a curved section of a circle; and 2) understand some of the ways archaeologist study ceramics to understand past cultures.

Method: Explain why archaeologists study prehistoric ceramics. Pass out the copy cat page and explain how to compute the circumference. Have the students complete the exercise.

Materials: A copycat page for each student, or sherds from the Archaeology Teaching Kit, or sherds from broken modern vessels.

Vocabulary:

sherd - a piece of broken pottery.

Background: The most common type of artifact that archaeologists find in Utah is pottery. Fired clay vessels are very durable, and will last for thousands of years, even if they are laying on the ground surface. Because styles are distinctive to particular groups of people and changed over time, pottery is of great assistance to archaeologists in determining how old a site is, and what group of people lived there. Archaeologists also want to know what certain pottery vessels might have been used for: were they for cooking, serving, or storing food? Because pots are most often found broken into hundreds of pieces (sherds), it is a tedious, and often impossible job to glue them all back together. One quick way to get an idea of how large a pot was is to calculate from a curved sherd what the circumference of the whole pot was. Using a rim sherd will indicate how large the opening was.

Many clues about how a group of people lived can be gained by studying vessel sizes and shapes. If enough of the pot is present, it is possible to calculate its volume, or storage capacity. The storage capacity of vessels allows calculation of how much stored food people had, and from that, estimates are possible of how many people lived at a site. Functions of different sizes of pottery can also be determined. A small-necked vessel probably stored liquids or very small seeds, rather than large seeds. Large open vessels, such as bowls, probably weren't used for storage, since they would be difficult to seal from moisture, rodents and insects.

Procedure: Explain why archaeologists study prehistoric ceramics and how they use the information to study the lifeways of past people.

Calculate the circumference of a pot represented by a sherd or the copycat page sherd drawing. If you are using real pottery sherds lay a rim sherd finished side down on a sheet of paper and trace around its inner edge. Use either the rim tracing or the first sherd on the copycat page, and measure a straight line between two points on the curve. Measure the length of that line (C, chord length), calculate its midpoint and then measure the distance from the midpoint to the curve edge (M, middle ordinate).

The formula to calculate the radius (r) of a circle from a portion of it is:

$$r = C^2/8M$$

The formula to calculate the circumference (c) is:

$$c = 2\pi r$$

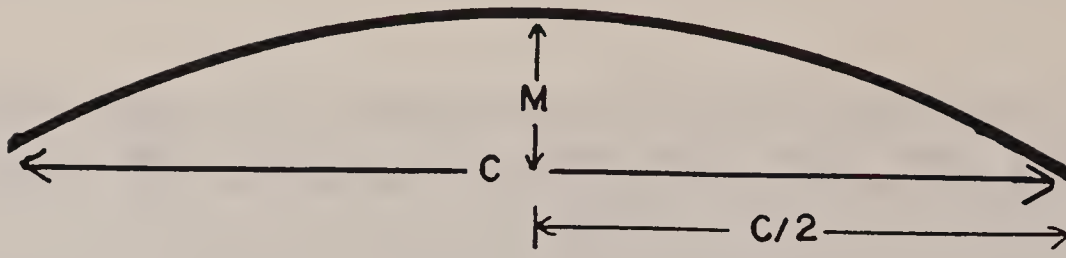
$$\pi = 3.14$$

The relationship between arc and radius is approximate. The formula is most accurate when the chord length used is small in comparison to the radius. Below is the range of error in calculations:

<u>C/R</u>	<u>Error (percent)</u>
1/1	6.4
1/2	1.6
1/4	.4
1/10	.1

Evaluation: Students calculate the circumference for each of the pots on the copycat page, and turn in their work for evaluation.

ANSWER SHEET

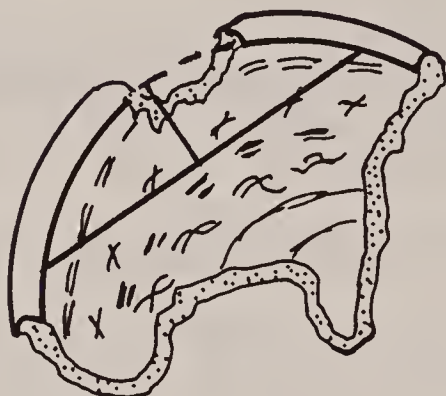
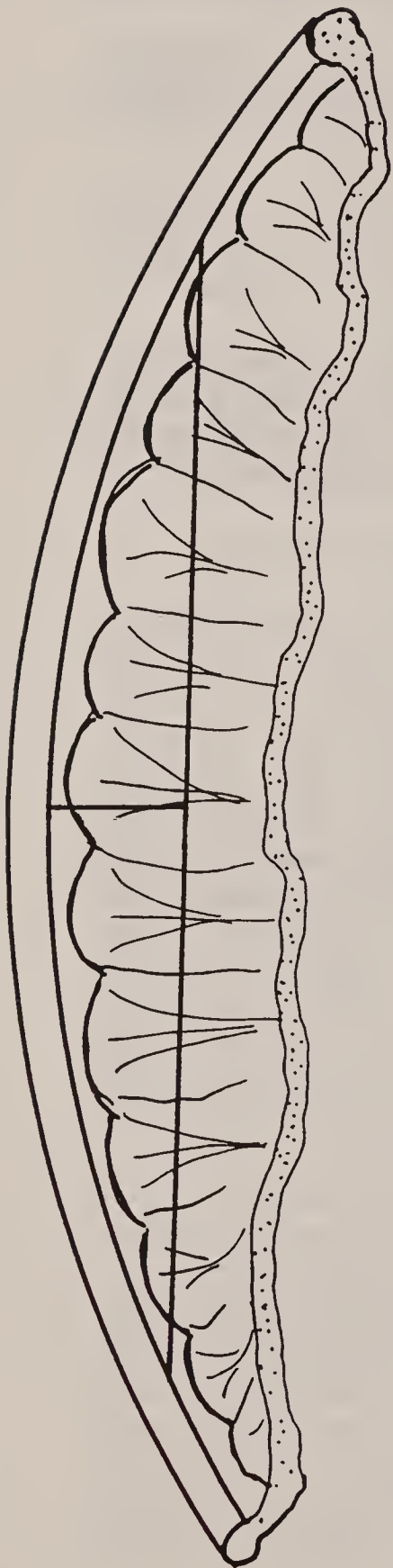


$$R = C^2 / 8M$$

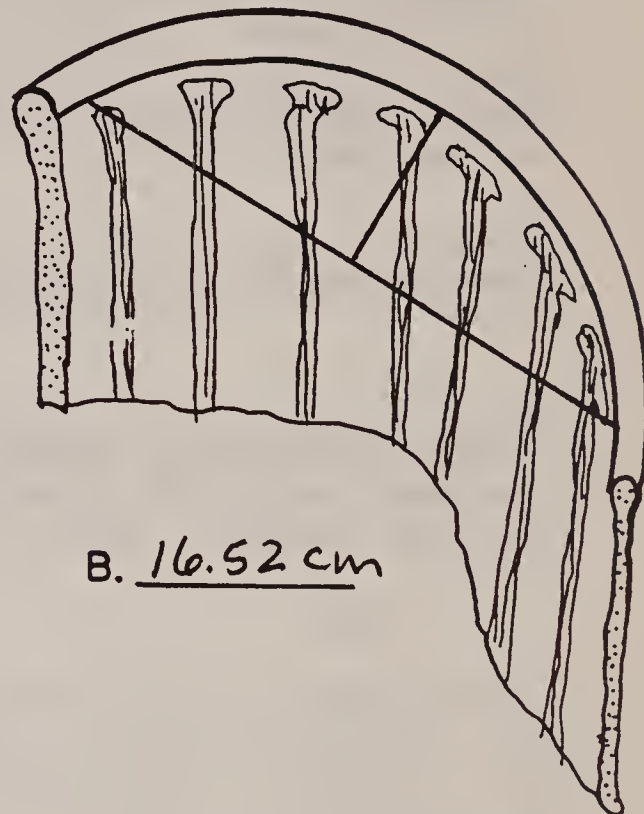
$$\text{CIRCUMFERENCE} = 2\pi R$$

Find the circumference of the pots represented by the sherds below.

A. 61.23 cm.

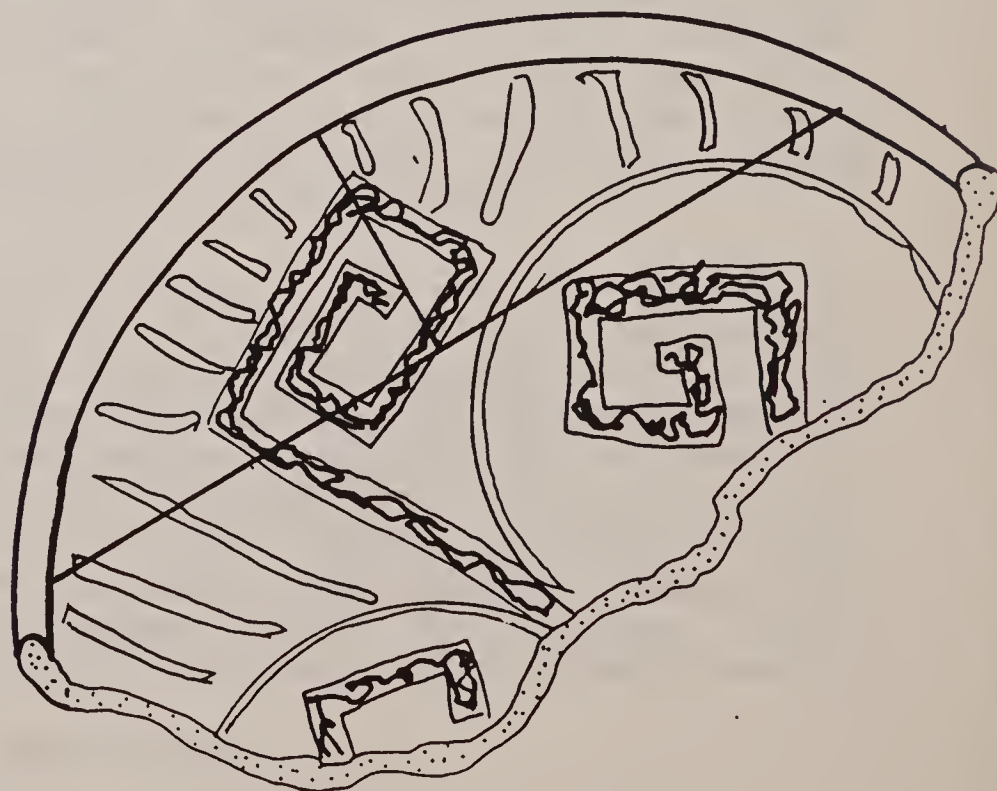


C. 11.93 cm.

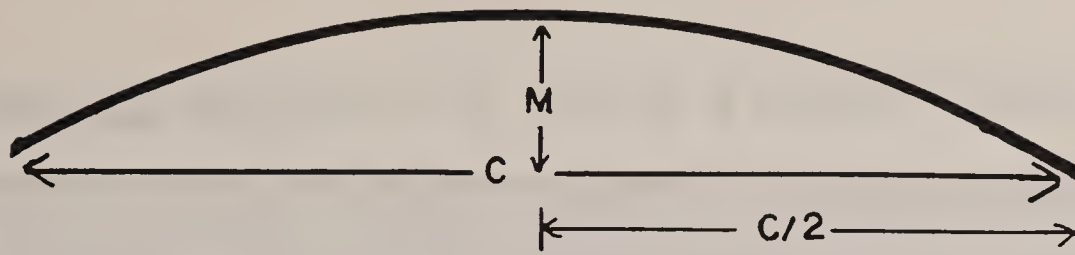


B. 16.52 cm

D. 25.56 cm



NOTE: photocopying reduces original images. Answers are therefore approximations.

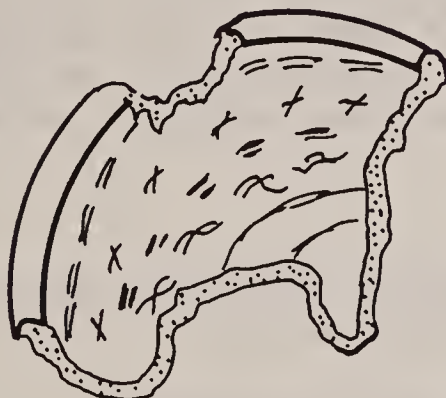


$$R = C^2 / 8M$$

$$\text{CIRCUMFERENCE} = 2\pi R$$

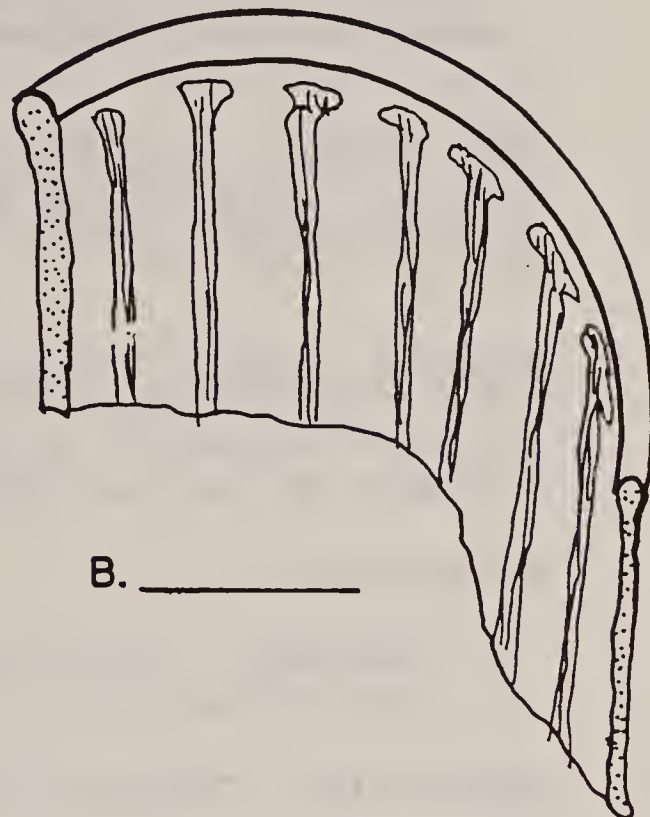
Find the circumference of the pots represented by the sherds below.

A. _____

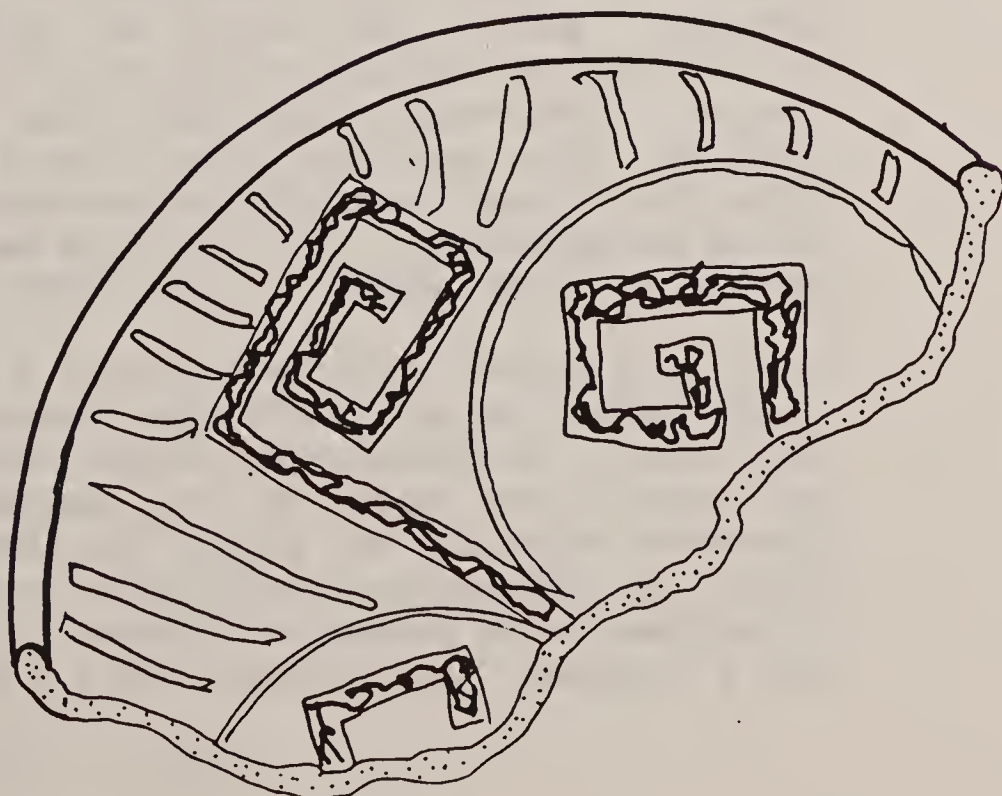


C. _____

B. _____



D. _____



GRIDDING A SITE Lesson 6 of Unit 3 - Studying and Valuing the Past

AGE:	8th - 12th grades
SUBJECTS:	Geometry, Archaeology, Mathematics
SKILLS:	Problem-solving, application, Cartesian coordinate system, square root, Pythagorean theorem
DURATION:	30 minutes
CLASS SIZE:	any

Objectives: Students will be able to 1) apply the Pythagorean theorem to grid an archaeological site; and 2) understand why archaeologists use a grid system when excavating archaeological sites.

Method: Explain why archaeologists grid sites before excavating them. Each student is given a copy of the copycat page illustrating the Cartesian coordinate system and the Pythagorean theorem. Students solve ten problems on the copycat page.

Vocabulary:

context - the relationship artifacts have to each other and the situation in which they occur.

Materials: Copycat page for each student.

Background: Before archaeologists ever excavate (or "dig") a site where people once lived, they place a grid over the site surface. Archaeology is a destructive science - once a site has been dug, it is gone forever, and can never be replaced with another just like it. The relationships of artifacts to each other, their context, tell the story of prehistoric people, just as the collection of things you have in your room reveals much about your nature, interests, and the time and culture in which you live. However, if a certain item, say a picture you cherish, was removed from your room and placed somewhere else, a piece of your story would be missing. The picture has been removed from its context, from the place where it was used.

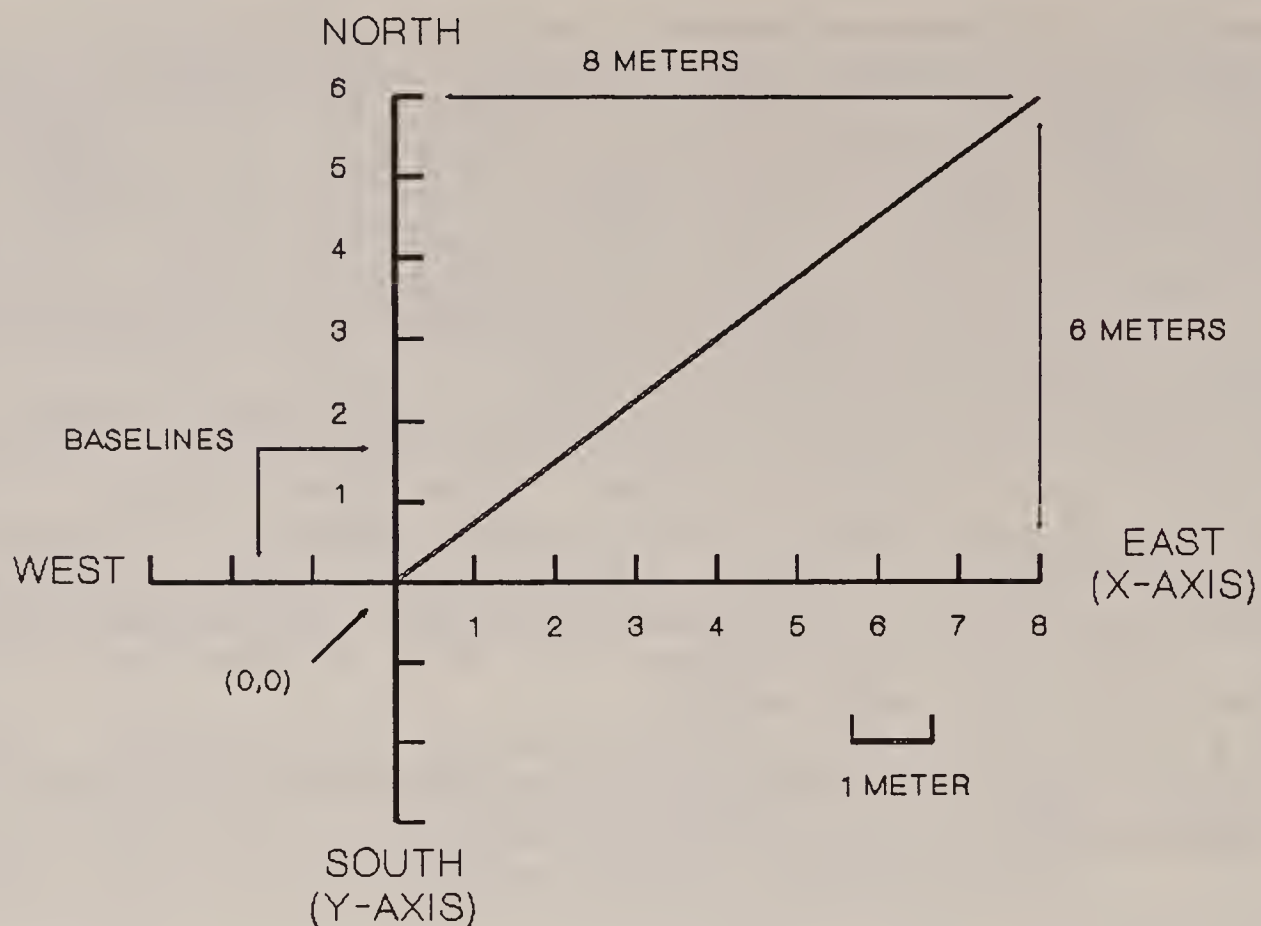
Because archaeologists destroy a site when digging it they record it on paper to preserve the context of all the artifacts and site features. Archaeologists can study a site forever if good notes and maps were made of the excavation. One way archaeologists preserve context on paper is through the use of the rectangular grid, or Cartesian coordinate system. Each square on the grid is marked with numbered stakes in the corners, so that each square has a unique "name" referred to by its coordinates. Any artifact

or samples that are found in that square are labeled with its grid number.

To lay out an accurate grid system, archaeologists use the Pythagorean theorem, $\sqrt{X^2 + Y^2} = Z$, where Z is the diagonal or hypotenuse. The base lines, the x and y axes, are placed on the ground by using a survey instrument, such as a transit. Tape measures are attached to two ends of the baselines defining a quadrant, and also to the origin, or (0,0) point. The intersection of the three tape measures gives an accurate location for placement of the corner stake diagonal from (0,0).

Procedure: Explain why archaeologists use the Cartesian coordinate system to grid sites being excavated. Give each student a copy of the copycat page. Discuss the Cartesian coordinate system and the cardinal directions with them. Explain how the length of the hypotenuse at (8,6) was computed using the Pythagorean theorem. Have them compute the hypotenuse for each of the remaining ten coordinates using the same method.

Evaluation: Evaluate students on the number of correct answers on the copycat page.



For each of the coordinate points listed below, calculate the length of Z.

$$(X, Y) \quad \sqrt{X^2 + Y^2} = Z$$

$$(8, 6) \quad \sqrt{8^2 + 6^2} = \sqrt{64 + 36} = \sqrt{100} = 10$$

$$(1, 1) \quad \underline{1.414}$$

$$(2, 1) \quad \underline{2.236}$$

$$(1, 2) \quad \underline{2.236}$$

$$(2, 2) \quad \underline{2.828}$$

$$(5, 4) \quad \underline{6.403}$$

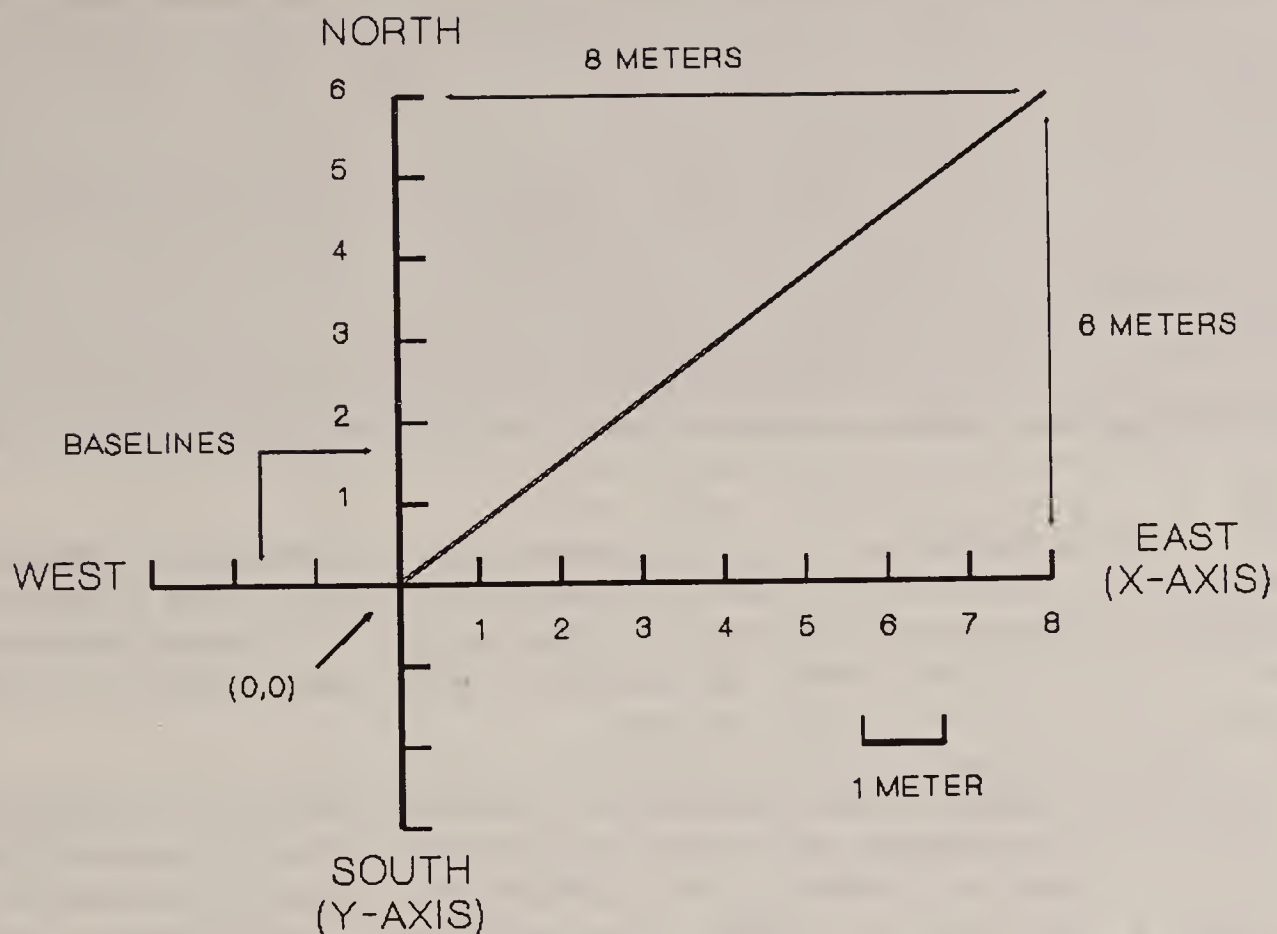
$$(3, 2) \quad \underline{3.464}$$

$$(1, 6) \quad \underline{6.083}$$

$$(7, 3) \quad \underline{7.616}$$

$$(6, 2) \quad \underline{6.324}$$

$$(2, 4) \quad \underline{4.472}$$



For each of the coordinate points listed below, calculate the length of Z.

$$(X, Y) \quad \sqrt{X^2 + Y^2} = Z$$

$$(8, 6) \quad \sqrt{8^2 + 6^2} = \sqrt{64 + 36} = \sqrt{100} = 10 \text{ meters}$$

$$(1, 1) \quad \underline{\hspace{10cm}}$$

$$(2, 1) \quad \underline{\hspace{10cm}}$$

$$(1, 2) \quad \underline{\hspace{10cm}}$$

$$(2, 2) \quad \underline{\hspace{10cm}}$$

$$(5, 4) \quad \underline{\hspace{10cm}}$$

$$(3, 2) \quad \underline{\hspace{10cm}}$$

$$(1, 6) \quad \underline{\hspace{10cm}}$$

$$(7, 3) \quad \underline{\hspace{10cm}}$$

$$(6, 2) \quad \underline{\hspace{10cm}}$$

$$(2, 4) \quad \underline{\hspace{10cm}}$$

MAPPING UTAH PLACE NAMES Lesson 7 of Unit 3 - Studying and Valuing the Past

AGE:	4th - 7th grades
SUBJECTS:	Geography, Social Studies, History, Language Arts
SKILLS:	Observation, comparing similarities and differences, mapping skills, reading, cooperative learning
DURATION:	1 class period
CLASS SIZE:	any, work groups of 4-5 students

Objectives: Students will be able to 1) list several Utah Indian and settler place names and their meanings; 2) name historic and modern Indian tribes in Utah and locate their reservations and traditional territories; and 3) compare the descriptive nature of both English and Indian place names.

Method: Small groups of students are each given a Utah State road map and a list of settler and Indian place names. As a contest, they locate as many of the place names as they can find. The teacher leads a discussion about how people of different cultures name places. Other discussion topics are suggested.

Materials: One Utah State road map for each work group, copies of Utah place names (copycat pages), one large Utah map, stars or paper dot markers; transparencies made from copycat map pages.

Background: It is an interesting contrast to examine how people from two different cultural traditions have named features on their shared landscape. Utah's Indian people tended to choose names that described the landscape or qualities of the area, "milky water" and "moonlight water", for example. Early settlers frequently named places for the commodities they produced, such as Coalville, Carbon County, and Bountiful. Utah has places named after both prominent Indian and Anglo people, although Indians generally did not name places after people. These different approaches to naming reflects the different cultural values of settlers and Indian people.

Utah's native people at the time of white contact were the Numic-speaking Shoshone, Goshute, Southern Paiute, and Ute people; and the Athabaskan-speaking Navajos (see Lesson 5, Unit 2). Today there are seven recognized tribes in Utah: Northwest Band of Shoshone, Confederated Tribes of Goshute Reservations (in Ibapah), Skull Valley Goshute, Southern Paiute, Ute, White Mesa Ute, and Navajo. Some of the tribes hold reservation and tribal lands.

Procedure: Give each group of 4-5 students a road map and the lists of Utah Indian and settler place names. Show students how to find a particular place by looking up the name and coordinates on the map index. For example, on some State road maps, Ibapah can be found near the intersection of coordinates F and 1. Working cooperatively, students are to lightly press a star next to each listed place name they find. If a listed place name is not on the map index, have students scan for it for bonus points. Allow about 15 to 20 minutes for the name hunt.

Display a large Utah map, and ask each group to share two or three places they have found. As the students call out the names and their meanings, place a star on the map.

Lead a discussion about similarities and differences in Indian and settler place names. Show the transparency of Approximate Boundaries of Indian Cultures, 1840 (copycat page). Including information from Lesson 5, Unit 2 about the Numic and Navajo people will greatly add to this discussion, especially regarding traditional uses of the land and resources.

Overlay the transparency of Utah Indian Reservations and Tribal Lands, 1981 (copycat page), or use the large Utah map. Locate current reservation and tribal lands for the students, pointing out the great reduction in traditional tribal lands.

Evaluation: As discussion points, or in quiz form, ask the following questions:

Contrast and compare settler place names with Indian place names. What kinds of things did settlers name places for? How did Indians name places? Can we say something about what is important to people based on how they name things?

Cover the tribal names on the transparency of Approximate Boundaries of Indian Cultures, 1840, and ask students to identify which tribe occupied each area.

List a settler place name and its meaning or origin, and an Indian place name and its meaning or origin.

Extensions: Discuss political boundaries, such as state lines, and how they contrast with geographical regions and boundaries like the Great Basin and the Colorado River. Prehistoric cultures seem to have often been separated by natural barriers, e.g. the Colorado River generally separated the Fremont from the Anasazi (Lessons 3 and 4, Unit 2).

Many lessons about geography and Native people can be built on the map and chart series Conquest of Indian America, a set of which is in each school district. A Teacher's Guide to the series is also available (Riley and Numkena 1988).

References:

Harrington, F.C., Florence Kerr, and Darrell J. Greenwell
1940 Origins of Utah Place Names. 3rd ed. Utah Writers
Project, Utah State Department of Public Instruction,
Salt Lake City, Utah.

Riley, Doloris and Wil Numkena
1988 A Teacher's Guide for the Maps and Chart Series- Conquest
of Indian America. Utah State Office of Education, Salt
Lake City, Utah.

Greer, Deon C.
1981 Atlas of Utah. Brigham Young University Press, Provo,
Utah.

UTAH INDIAN PLACE NAMES

1. *Utah - "Utas", a group of the Ute people
2. *Uinta - named derived from "Uinta-ats", a large subgroup of the Ute people
3. *Wasatch - a Ute Indian word meaning "mountain pass"
4. Ibapah - a Goshute word meaning "white clay or milky waters"
5. Goshute- A Utah tribe, believed to mean "dusty people"
6. *Oquirrh - "wooded/forested mountain"
7. Parowan - "marsh land."
8. Panguitch - "waters plentiful with fish "
9. Ouray - A Ute Indian leader, Peace Chief of the Ute White River Indians
10. Kanab - A Paiute word meaning "willow"
11. Kanosh - a Pahvant Paiute Indian chief
12. Peoa - "marry"
13. *Timpanogos - "river in a rocky mountain"
14. *Oljeto - (ole-Jay-toe), San Juan County; derived from a Navajo Indian word meaning "moonlight water."
15. Washakie- named for a Shoshone leader who was friendly to the early settlers of northern Utah.

* a place not likely to be listed on road map index

(excerpted from Harrington et al. 1940)

UTAH SETTLER PLACE NAMES

1. Provo - named for Etienne Provost, a French-Canadian trapper who visited this region in the 1820's; first called Fort Utah.
2. Richfield - named for the richness of the soil; first called Omni for a Book of Mormon character.
3. Helper - named by the Denver and Rio Grande Western Railroad because at this point additional locomotives were necessary to help trains westward over Soldier Summit.
4. Farmington - so named because of the farming activities of its early residents.
5. Coalville - named for the near-by coal deposits
6. Brighton- a mountain resort named for Thomas W. Brighton who built some of the first houses there.
7. Brigham City - named in honor of Brigham Young
8. Escalante - Named for Francisco Silvestre Velez de Escalante, a Spanish priest who explored Utah in 1776, although the route he traveled was 150 miles to the west of this town. First called Spud Valley.
9. Fillmore - named in honor of Millard Fillmore, thirteenth President of the United States.
10. Cedar City - So named because of the abundance of cedar (juniper) trees in the area.
11. Magna - derived its name from a near-by mine.
12. Ogden - named after Peter Skene Ogden, a trapper who worked for Hudson's Bay Company in this vicinity in the 1820's.

(excerpted from Harrington et al. 1940)

Shoshone

**APPROXIMATE BOUNDARIES
OF INDIAN CULTURES, 1840**

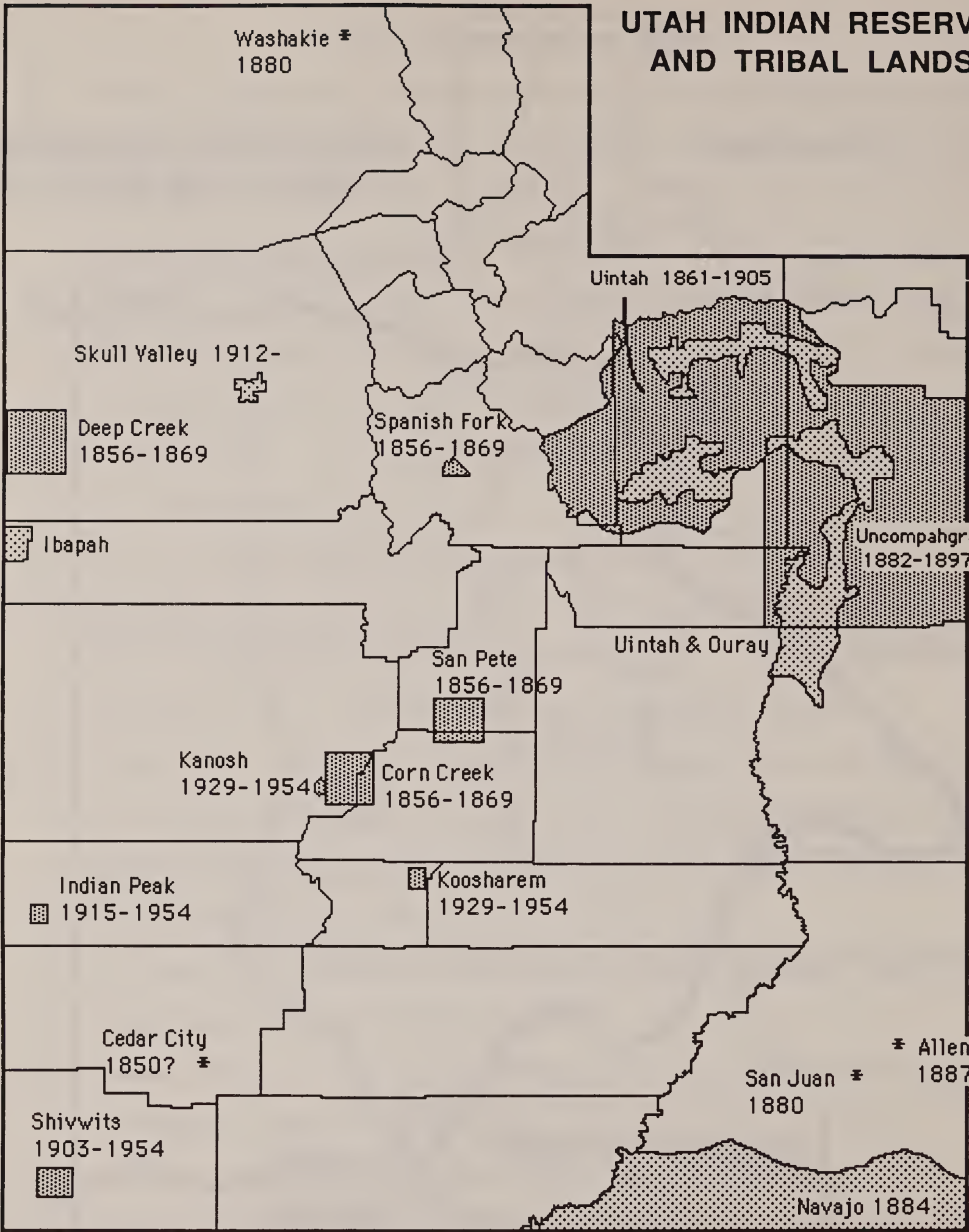
Goshute



Ute

Southern Paiute

Navajo

UTAH INDIAN RESERVATIONS AND TRIBAL LANDS, 1981



Current Reservation 
 Historic Reservation 

Current Tribal Land *

Source: Atlas of Utah, 1981

ROCK ART 1 Lesson 8 of Unit 3 - Studying and Valuing the Past

AGE:	4th - 7th grades
SUBJECTS:	Social Studies, Language Arts, Archaeology
SKILLS:	Comparing similarities and differences, observation, discussion, writing
DURATION:	1 class period
CLASS SIZE:	any

Objectives: Students will be able to 1) define rock art, petroglyph, and pictograph; and 2) appreciate different perspectives on rock art.

Method: This lesson is first in a series of three. Rock Art 1 introduces students to rock art and various interpretations of it. Rock Art 2 is an art activity and discussion of how to protect rock art. Rock Art 3 concerns vandalism to rock art and other archaeological resources, and reviews legislation that protects archaeological resources.

For Rock Art 1, the teacher explains the meaning of "symbol", defines pictographs and petroglyphs, and shows the class color pictures of rock art. Students then observe a drawing of a rock art panel from Mesa Verde National Park, Colorado. Students write a story about their interpretation of the panel, then hear how four Hopi men interpreted it.

Materials: Color photos of pictographs and petroglyphs; copycat page for each student or transparency made from copycat page.

Vocabulary:

petroglyph - a design chiseled or chipped out of a rock surface.

pictograph - a design painted on a rock surface.

rock art - a general term for the pecking, incising, or painting of designs onto natural rock surfaces.

rock art panel - a group or collection of pictograph or petroglyph figures.

symbol - something which represents something else.

Background: Indian people over all of North American created rock art in prehistoric times. Its meaning is mysterious and at times controversial. Some people think that rock art is a type of story telling. Others believe it depicts religious or spiritual beliefs, while still others regard it as solely an artistic expression.

North American rock art is not a true writing system which can be "read" like Egyptian hieroglyphics or a phonetic alphabet, although some rock art specialists attempt to decode rock art symbols. Archaeologists analyze rock art figures and patterns, and frequently find that different cultural groups made different styles of rock art. Other rock art researchers analyze stories and information from Indian people to draw conclusions about rock art.

Indian tribes have oral traditions about rock art and its meaning. Many Indian people believe that the spirit of the maker resides in what they have created. Clifford Duncan, Director of the Ute Tribal Museum and a Ute Indian, says that he feels rock art is living, that it has a spirit.

What ever our responses to, or interpretations of rock art may be, it stimulates our thoughts and imaginations and expands our awareness of cultural expressions. Rock art can mean something different to each person who ponders it. We in Utah are fortunate to have many examples of these beautiful and ancient messages.

Procedure: The teacher discusses with students the meaning of symbol, pictograph, and petroglyph, and shows the class color photos of pictographs and petroglyphs found in Utah.

Either project or give each student a copy of the copycat page showing a petroglyph panel at Mesa Verde National Park. Students write their interpretation of what the panel might mean. Read to the students how four Hopi men interpreted the petroglyph. Follow this with a discussion comparing the different interpretations.

Evaluation: Students turn in their written interpretation.

Reference:

Mesa Verde Museum Association Inc.

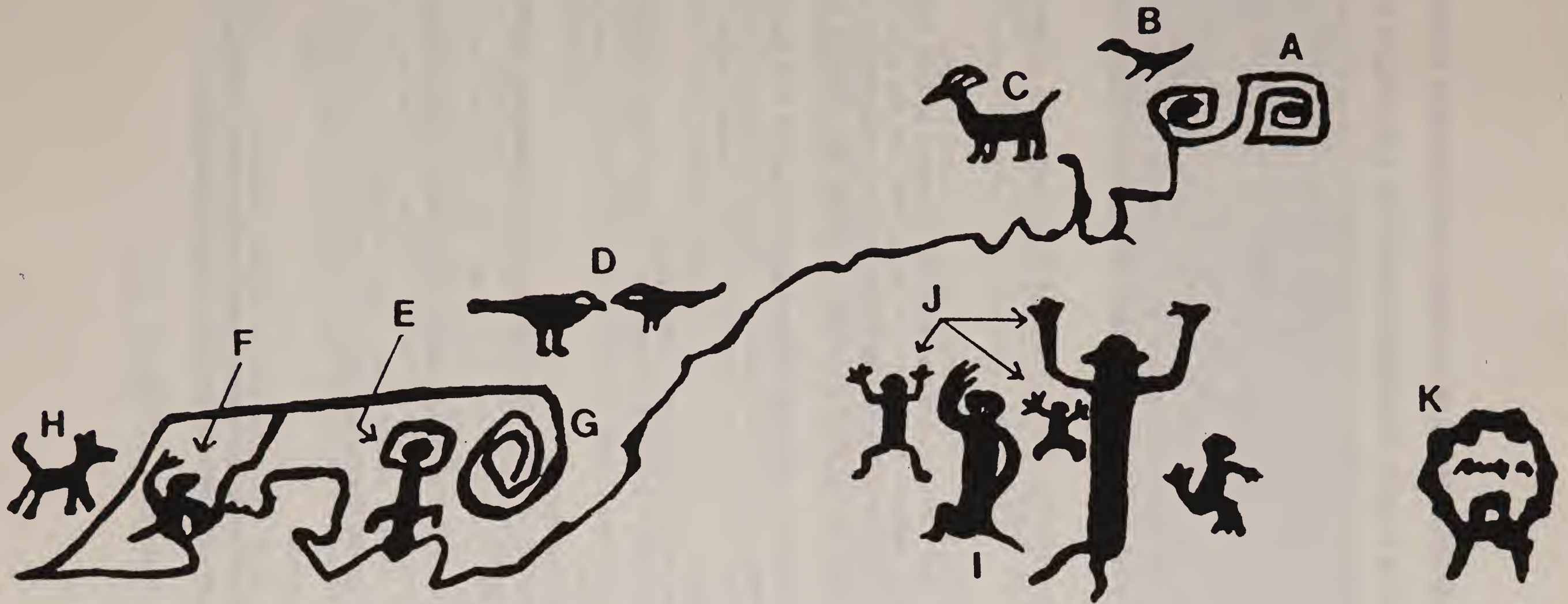
n.d. Petroglyph Trail Guide. Mesa Verde Museum Association, Inc., Mesa Verde National Park, CO.



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PETROGLYPHS



Letters refer to the key and are not part of the original rock art

HOPI INTERPRETATION OF PETROGLYPH PANEL AT MESA VERDE NATIONAL PARK

In 1942, four Hopi elders visited the petroglyph panel, and interpreted it this way:

- A. Sipapu, the place at which the Pueblo people emerged from the earth.
- B. Eagle Clan symbol indicating a separation of that clan from the other people and settlement near their point of origin.
- C. Mountain Sheep Clan symbol denoting that clan's separation from other migrating people and their settlement some distance from the others' travel route. (Tradition says this clan "dropped off" in the vicinity of Shiprock, New Mexico).
- D. Parrot Clan symbol telling of that group taking up residence at some distance from the Mountain Sheep Clan.
- E. Two interpretations:
 - A. Horned Toad Clan symbol denoting the locations of their split from the migrating Pueblos.
 - B. Lizard Spirit symbol whose influence upon the people led them into a period of wandering without direction - almost approaching lunacy.
- F. The "whipping kachinas" who "straightened out" the people and gave directions to their later travels.
- G. Two interpretations:
 - A. The actual end of migration - Mesa Verde.
 - B. The "prophesied" end of the migration - modern Hopi villages.
- H. Two interpretations:
 - A. Mountain Clan symbol
 - B. Representation of an "all-powerful" animal spirit watching over the people in their travels.
- I. Whipping kachinas "influencing" the people as represented by the figures marked "j".
- J. Representations of the Pueblo People.
- K. Kachina Clan symbol.

These are modern day Hopi interpretations and may or may not have been the interpretations given them by the "rock artists" who produced them.

(Mesa Verde Museum Association, n.d.:10-11).

ROCK ART 2 Lesson 9 of Unit 3 - Studying and Valuing the Past

Adapted from an art activity developed by Rebecca Berru-Davis.

AGE:	4th - 7th grades
SUBJECTS:	Art, Archaeology, Citizenship
SKILLS:	Cooperative learning, eye-hand coordination discussion, drawing
DURATION:	1 class period
CLASS SIZE:	any, no more than 10 students per adult aide

Objectives: Students will 1) create artwork which resembles a petroglyph; 2) cooperatively create a "rock art panel"; and 3) discuss ways everyone can protect rock art.

Method: This lesson is the second in a series of three.

Students are shown examples of rock art symbols and then create an artwork resembling a petroglyph. Each student contributes to making a "rock art panel" for classroom display. A discussion follows about ways individuals can protect rock art.

Materials: Brown construction paper, a roll of brown butcher or unwaxed wrapping paper, a box of Q-tips, one cup of chlorine bleach, paper cups; copycat pages for each student or transparencies made from copycat pages.

Vocabulary:

deface - spoiling or marring the surface or appearance of something.

Background: Rock art "occurs in caves, on cliff walls, or on boulders. Rock art occurs all over the world, in virtually every culture, and surviving examples are known to be as old as 30,000 years, from the time of the last Ice Age. In modern America, the most common kind of "rock" art is that which is painted on the concrete and brick walls of the artificial canyons of our cities and on bridge abutments and rock faces along our highways. In modern American culture, as in all cultures, it expresses the values, attitudes, beliefs, and desires of the society" (Hurst and Pachak 1989:1).

Procedure: Either project the copycat page of Utah rock art symbols with an overhead projector, or give each student a copy. Explain to students that they will be making an artwork which

resembles petroglyphs, using symbols to tell a story. They will also each contribute to a "rock art panel".

Tape a long piece of butcher or wrapping paper to the bottom of the chalkboard. Divide the class into groups no larger than ten students. An adult aide is necessary for each group. Alternatively, have only one group at a time do the activity.

Give each student a piece of brown construction paper and a Q-Tip. The art is created by dipping the Q-tip in bleach (which can be diluted with water) and rubbing it on the paper to form the desired design. Demonstrate the process, emphasizing to students that they must be very careful not to touch anything but the paper with their Q-tip. Place a jar lid with a small amount of bleach in the center of the worktable or carry a small cup of bleach to each student and have them dip their Q-tip. They should only need one or two dips for the activity.

After students have completed their "petroglyph" they take turns making figures on the large piece of butcher paper. Space students a few feet apart, and have small groups work at a time. Exhibit the "rock art panel" in the classroom or hallway. It can be used for an activity in Rock Art 3.

Conclude the lesson with a discussion of things not to do at rock art sites. Either project the copycat page of Things Not To Do with an overhead projector, or give each student a copy.

Extension: As an art and citizenship activity, have students choose one item from the Things Not To Do copycat page to illustrate. They draw or paint a picture, then cut out a circle from red construction paper and place it around their picture. Glue a strip of red paper diagonally across the picture so that it looks like the international "Don't Do This" symbol. Place the artwork in the classroom or hallway near the "rock art panel".

References and Copycat Page Sources:

- Castleton, Kenneth B.
1979 Petroglyphs and Pictographs of Utah. Vol. 2. Utah Museum of Natural History, Salt Lake City.
- Hurst, Winston B., and Joe Pachak
1989 Spirit Windows: Native American Rock Art of Southeastern Utah. Edge of the Cedars Museum. Blanding, Utah.
- Schaafsma, Polly
1971 The Rock Art of Utah. Papers of the Peabody Museum of Archaeology and Ethnology Vol. 65. Harvard University, Cambridge, MA.

PROTECTING ROCK ART

THINGS NOT TO DO

1. **Touching** rock art with your hand can damage the rock art.
2. **Making paper rubbings or tracings** may damage the rock art.
3. **Making latex molds** of rock art can damage the rock art and should only be done by professionals if the rock art is going to be destroyed by construction or development.
4. **Building fires nearby** can cause serious damage from smoke and high temperature.
5. **Taking it home.** Some selfish people have taken it upon themselves to steal rock art by using rock saws and chisels.
6. **Chalking** is harmful to the rock.
7. **Re-pecking or re-painting** a difficult-to-see image doesn't restore it, but rather destroys the original; there is no such thing as "restoration" of rock art.
8. **Defacement.** Short-sighted, selfish, insensitive people often paint their names over rock art, or shoot bullets at it. All forms of defacement are signs of disrespect for other cultures.
9. **Tunnel vision.** People like rock art so much, they often forget to watch where they are walking and may trample or damage important artifacts.
10. **Removal or rearrangement of artifacts** destroys archaeological data. Artifacts should be left where they are found. While it is O.K. to pick up and look at most artifacts, you should not make piles of artifacts at the site or take them home.
11. **Disturbance of the ground.** Any digging at an archaeological site is not allowed. Even too many visitors walking around may damage an archaeological site. Visitors should tread as lightly as possible, especially on loose slopes and under rock overhangs.

(Excerpted from Hurst and Pachak 1989:25-26).

UTAH ROCK ART SYMBOLS





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ROCK ART 3 Lesson 10 of Unit 3 - Studying and Valuing the Past

AGE:	4th - 7th grades
SUBJECTS:	Social Studies, Archaeology, Language Arts, Citizenship
SKILLS:	Observation, value clarification, discussion
DURATION:	1 class period
CLASS SIZE:	any, work groups of 4-5 students

Objective: Students will 1) examine their feelings about rock art vandalism through a contrived experience; 2) appreciate the fragile and finite nature of archaeological sites; 3) discuss the impacts of vandalism on archaeological resources; and 4) learn about laws which protect archaeological resources.

Method: This lesson is third in a series of three.

As a class discussion or in small groups students express their feelings about their rock art panel from Rock Art 2 being threatened or damaged. Students observe and discuss photographs of vandalized rock art. A law that protects archaeological resources is discussed, as well as what everyone can do to save the past.

Materials: "Rock art panel" from Rock Art 2; photograph of vandalized rock art.

Vocabulary:

vandalism - willfully or maliciously defacing or destroying public or private property.

Background: Utah is fortunate to have many fine examples of rock art, and a rich archaeological heritage. Few places in the world can boast such a long and well-preserved archaeological record as does Utah. Our past, however, is threatened by people who dig sites looking for artifacts and who vandalize rock art panels and other sites.

Collecting artifacts, digging sites, and defacing rock art and ruins has several harmful results. First of all, it destroys data, the evidence of people who lived here before us. Sites are very fragile, and one person with a shovel and ten minutes can destroy hundreds of years of prehistory. We and the generations of tomorrow are being robbed of the chance to learn from Utah's past.

Secondly, disturbing and vandalizing sites attacks the cultural heritage of Native Americans. These sites are the burial grounds, homes and sacred places of their ancestors. Archaeological sites

represent part of their spiritual and cultural legacy. To destroy or deface these places is equivalent to vandalizing your home, church, and cemetery.

Finally, people who vandalize and destroy sites steal from all of us the opportunity to appreciate and understand other cultures. We have a great deal in common with the people who have been Utah's citizens over the past 12,000 years. It is a personally enriching experience to gain a perspective on one's life and time by understanding how and where we fit in the human history of this land.

Federal and State laws provide for severe penalties to those who disturb and destroy sites over 100 years old. The Archaeological Resources Protection Act (ARPA) was passed in 1979, and prohibits unauthorized digging and collecting of archaeological resources, including pottery, basketry, bottles, sites with coins or arrowheads, tools, structures, pithouses, rock art, graves and human skeletons. No person may sell or buy any archaeological resource which was illegally acquired. Penalties for those convicted of violating ARPA are:

1. First Offense - a person who breaks this law for the first time may be fined \$100,000 and spend 1 year in jail. If the cost of repairing the damage exceeds \$500, the offender may receive a fine of \$250,000 and spend 2 years in jail.
2. Second Offense - a person who breaks this law for the second time may be fined \$250,000 and spend 5 years in jail.
3. Vehicles and other equipment used in breaking this law may be confiscated.

ARPA provides for REWARDS to people who supply information leading to the arrest and conviction of ARPA violators.

ARPA applies to all Public Lands, including those administered by the U.S. Forest Service, Bureau of Land Management, the military, Fish and Wildlife Service, and the Park Service.

Statutes similar to ARPA were passed in Utah 1990, and apply to all State lands. Additionally, on private lands State law requires the express permission of the landowner before digging archaeological sites. This means that people digging on private land can be convicted if the landowner has not explicitly given permission.

State law also states that it is a felony to disturb a human burial, even one accidentally unearthed at an archaeological site. (Archaeologists excavating with authorization are exempt).

Everyone should be aware that some people excavating sites are engaged in a black market activity, are armed with weapons, and are to be considered dangerous. Never approach someone about excavating sites unless you are very sure that they are casual collectors or ignorant of the law. The best thing to do is to record information about the people digging - their physical description, what they were seen doing, the license number of their vehicle - and report them to the land managing or law enforcement agency.

People recreating in the out-of-doors frequently find archaeological sites, and wonder what they should do. Always leave artifacts where they are found. Discoveries of rare or remarkable artifacts and sites should be reported to the land managing agency, or, in the case of private lands, to a local agency archaeologist or the Utah Division of State History.

Procedure: The purpose of the first part of this activity is to cause students to react to their "rock art panel" being defaced or threatened. The teacher will have to decide the best approach for his or her class. If the students are mature and if they will not think that school is an unsafe place, then the teacher anonymously defaces the "rock art panel" by painting names over it. Say nothing to the students, but when they begin to talk about it, start the activity. Alternatively, bring the rock art panel into the classroom and, holding a can of spray paint, ask "How would you feel if I were to write my name over the rock art panel you all created? Would that harm it?"

Show students the photo of defaced pictographs, which are located southwest of Price, Utah. Ask them how they feel about the vandalism that has been done to these ancient and irreplaceable rock art panels, and what they think should be done about it.

Inform the students about the problem Utah is having with people vandalizing archaeological sites, including rock art panels, ruins, cave sites, and historic buildings. Present the background information, emphasizing the harmful results of vandalism to the science of archaeology, Native Americans, and to everyone's opportunity to learn from other cultures. Connect their feeling about their rock art being damaged to how Native Americans and archaeologists feel when they see vandalized sites.

Review ARPA and its penalties, and the State laws that protect archaeological resources. Outline what students should do if they see someone digging or vandalizing sites or collecting artifacts.

Evaluation: Have students write about their feelings on vandalism of archaeological sites. Then ask them to write about vandalism from the viewpoint of a Native American or an archaeologist.

Extension: Artifact Ethics, Lesson 11 Unit 3, is a good activity to follow this one.

ARTIFACT ETHICS Lesson 11 of Unit 3 - Studying and Valuing the Past

AGE:	6th - 12th grades
SUBJECTS:	Social Studies, Language Arts
SKILLS:	Analysis, application, discussion, evaluation, problem solving, cooperative learning, writing
DURATION:	1 class period
CLASS SIZE:	any, work groups of 4-5 students

Objectives: Students will be able to: 1) examine their own values and beliefs about archaeological site preservation, pothunting and Native American perspectives on archaeology, and 2) evaluate possible actions they might take regarding site and artifact preservation.

Method: Students will read, discuss, make judgments and write about hypothetical dilemmas concerning archaeological sites and artifacts.

Background: This activity is designed to give students the opportunity to examine their own values and beliefs about preserving archaeological sites and artifacts. They also have opportunities to consider different perspectives on removing artifacts or disturbing archaeological sites. It is not the intent of this activity to prescribe "right " and "wrong" answers for the students, except in the areas where laws apply. The purpose of this activity is to provide students with an opportunity to make their own judgments about what they think would be the most responsible and appropriate actions to take in each described situation. This lesson should not be taught unless students have a background in archaeological methods and issues, preferably after teaching Unit 1 and lessons from Unit 2.

Federal and State antiquities preservation laws state that it is illegal to collect, deface, injure, or excavate sites and artifacts older than 100 years on Public Land. Public Land includes lands administered by any state or federal agency, such as the Bureau of Land Management, Park Service, Forest Service, and the Fish and Wildlife Service. Utah State law further states that the above activities are legal on private land only with the express permission of the landowner. Archaeologists conducting approved research are granted permits by federal and state agencies to excavate sites.

People recreating in the out-of-doors frequently discover an archaeological site or artifact. By law, the artifact is to be

left in place, and the site left undisturbed. Discoveries of rare or remarkable artifacts and sites should be reported to the land managing agency, or, in the case of private lands, to a local agency archaeologist or the Utah Division of State History.

Students should know that some people excavating sites are engaged in a black market activity, are armed with weapons, and are to be considered dangerous. Students should never approach someone about excavating sites unless they feel very sure that the diggers are casual collectors or ignorant of the law. The best thing to do is to record information about the people digging - their physical description, what they were seen doing, the license number of their vehicle - and report them to the land managing agency or law enforcement. The Archaeological Resources Protection Act allows for rewards to people providing information that leads to the arrest and conviction of people disturbing sites.

Materials: Dilemma cards.

Procedure: Copy the dilemma pages and glue each dilemma on an index card. Other dilemmas could be written that are more specific to problems in your area. Students could also create Dilemma Cards, with each student responsible for one card.

Take one of the Dilemma Cards and read it aloud to the entire class. Without group discussion, ask the class to write a paragraph or two about how they feel about the dilemma, and what they would do about it. Have them keep their papers for their own values clarification (often values change once there is group discussion and others' perspectives are introduced).

Another approach to this activity is to have the students turn in their papers (without names) and write several of their dilemma solutions on the blackboard until you have listed many strategies and viewpoints.

Have the students discuss the pros and cons of each solution and perhaps come to a class consensus. This activity can help students clarify their values, while demonstrating that there are many perspectives on any issue. Ask the students to reconsider what they had originally written. Have their values changed after listening to other view points?

Now, divide the class into groups of 4 to 5 students and give each group one of the Dilemma Cards. Have the students discuss the dilemma as a group and decide what they would do about the situation. Allow about 15 minutes for their discussion. Choose a spokesperson for each group to report to the class the group's decision and their reasons for taking the actions or positions they did. Were they able to all agree on what they would do?

Ask the students if they felt they had enough information upon which to base their decisions. Ask them if their opinion changed once they heard different points of view.

Evaluation: Each student is assigned a dilemma. They write a short paragraph on the positive and negative effects of all the options listed for that dilemma, indicating what additional information, if any, is needed in order to make a responsible and informed decision. Finally, the student identifies which decision, in his or her judgement, is the most appropriate and responsible, explaining their reasoning.

Extensions: Divide the students into groups as above, but this time give each group the same dilemma. Discuss the ways the different groups addressed the same issue.

Another technique to help students clarify their values on any one of these dilemmas is to have them raise their hands if they agree with a situation, fold their arms if they are unable to make a decision, (due to not having enough information, or simply being undecided) and a thumbs down if they disagree.

Dilemma 1

You are on a camping trip to Canyonlands National Park with some of your friends and your family. Your parents stop the car in the parking lot to visit "Newspaper Rock," a famous sandstone wall of Anasazi rock art. You and your friends are walking up to the rock art when you pass a man and a woman carrying a large bag. As you continue walking, you can see the large sandstone wall covered with rock art. You look closer, and see that there is fresh red spray paint signatures covering several of the rock art figures. The paint is still dripping down the wall as you arrive. What do you do?

- Run back to the man and woman and tell them it is against the law to damage rock art.
 - Do nothing, mind your own business.
 - Get their license plate number, description of the car and the people, and report them to the National Park Ranger.
 - Use some of the wet paint to write your names too. After all the pioneers and Indians wrote their names and symbols on rocks.
 - Call the police back home.
 - Have your parents make a citizen's arrest of the man and the woman.
-

Dilemma 2

You are on a scouting trip to visit an old historic ghost town. Your scout leader takes you into an old building where there are a lot of relics laying around including bits and pieces of pottery. Your teacher has informed you that historic places are protected by the law and that you should take nothing but photographs and leave nothing but footprints. As you are leaving, you notice that your scout leader is picking up several pieces of pottery and some of the other artifacts. Several of the scouts are doing the same thing. When you tell the leader what your teacher said about not taking artifacts, the leader answers by saying "Taking little things like broken pottery doesn't count." What do you do?

- Act as though you saw nothing, let them take it home.
- Pick up just one piece of pottery as a souvenir.
- Do nothing, knowing that you were obeying the law by not taking anything.
- Find another scout troop.
- Report the scout leader to the police.

Dilemma 3

You are a judge in a case where a man has been charged with pothunting and selling Anasazi artifacts through an illegal market. He has been unemployed and is using the money to buy food for his family. What do you do?

- Put him in prison for nine months.
 - Fine him \$5000.
 - Release him with a warning.
 - Inform him that there are social services to help him support his family, so that he does not have to destroy the irreplaceable past. Also fine him.
 - Other.
-

Dilemma 4

You are an archaeologist excavating sites in an area that is going to be flooded when a dam is built. The dam is needed to supply water to nearby communities. Your excavation team has just started uncovering what appears to be a large Indian burial site. You know that local Indian tribes would be upset to learn that a sacred site and the graves of their ancestors are being disturbed. They could halt or delay construction of the dam. What do you and your team do?

- Continue to dig the site and wait until the site is excavated to tell the Indian tribes about the burials.
- Stop excavating immediately and report the site to the local tribes.
- Continue excavating but ignore the burials and don't record them.
- Stop the excavation and recommend that the site somehow be preserved.
- Resign so you won't have to get involved.

Dilemma 5

You are an amateur archaeologist aware that construction of a large dam will eventually cover an entire canyon containing many Fremont Indian sites. One of your friends asks you if you want to go to the canyon and retrieve just a few artifacts because, after all, if you don't the artifacts will just be buried under the reservoir created by the dam. What do you do?

- Go and get just one or two artifacts in the canyon. Maybe the law does not apply to areas that are going to be destroyed anyway.
 - Don't go with your friend and if your friend goes, anonymously report him/her to the law.
 - Refuse to go and tell your friend that it is against the law.
 - Let him or her go and get a few things for you.
 - Organize a local group of amateur archaeologists to work with professional archaeologists so that more information can be recovered before the reservoir is flooded
-

Dilemma 6

You are a local police officer in a small town and you suspect several people are pothunting on Federal land and are illegally selling artifacts. These people claim that they found the artifacts on their own property, and it is legal to sell them. What do you do?

- Try to follow these people and catch them in the act.
- Call in federal agents from another town to investigate these people, because many of them are your neighbors.
- Don't do anything unless you catch them in the act because it is your hunch against their word.
- Try and get them involved in amateur archaeology organizations and classes so they will understand the importance of preserving sites on private and public lands.

Dilemma 7

You are hiking in a remote section of a National Park and discover a large Anasazi pot that is wedged in between two rocks. What do you do?

- Try to remove the pot and take it back to the National Park Rangers.
 - Leave the pot where you found it, photograph it, carefully record on a map where in the Park you found it and turn your information over to the National Park Service.
 - Leave the pot there and don't tell anyone about it or its location.
 - Remove the pot, hide it in your car and take it home.
-

Dilemma 8

You are visiting a large Anasazi Indian ruin site. There is a large sign by the ruins saying "These ruins are very fragile! Do not take anything, and do not touch the ruins, walk on, or go into the ruins." You are eating your lunch when a family arrives and ignores the sign. Kids are walking on top of the ruins and are picking up corn cobs and pieces of pottery and putting them in their pockets. What do you do?

- Ask the family politely if they have read the sign.
- Ignore them, it is really none of your business.
- Tell them they are breaking the law.
- Say nothing and try to hike out first, to find a ranger and report them.
- Other.

BROKEN POTS: CLASSIFICATION Lesson 12 of Unit 3 - Studying and Valuing the Past

<u>AGE:</u>	<u>4th - 7th grades</u>
<u>SUBJECTS:</u>	<u>Archaeology, Science</u>
<u>SKILLS:</u>	<u>Classification, hand-eye coordination, observation-inference</u>
<u>CLASS SIZE:</u>	<u>any, work groups of 4-5 students</u>
<u>DURATION:</u>	<u>30 minutes</u>

Method: This lesson is a supplement to Classification and Observation-Inference Lesson 1 of Unit 3. Using sherds from modern ceramics, students classify and infer the number of vessels represented by the sherds. They reconstruct the vessels and compare actual number of vessels to their hypothesized total.

Vocabulary:

assemblage - a group of artifacts found together.

sherd - a piece of broken pottery.

Materials: One sherd assemblage for each work group of 4-5 students.

Procedure: Give one sherd assemblage to each student work group. Obtain five to ten ceramic vessels for each assemblage. Second hand stores sell dishes inexpensively. Stoneware is the recommended type of ceramic to use, since it typically breaks into a few dozen pieces. Some other types of ceramics may shatter into literally thousands of pieces. Two of the vessels are to be the same; two cups are suggested. The remaining vessels need to be different in surface glazing and shape. Break all of the vessels and put all of the assemblage pieces together in a shoe box or paper bag.

Students work together to sort and classify the sherds into different categories. When they have finished sorting, ask them how they knew how to separate the pieces. Color? Shape? Both? Ask them to infer how many separate vessels are represented, and explain how they made the inference.

Next have the students reconstruct the vessels using white glue. As they progress ask them if they have changed their minds about the number of vessels represented in the assemblage.

TECHNOLOGY AND CULTURAL CHANGE Lesson 13 of Unit 3 - Studying and Valuing the Past

AGE:	4th - 7th grades
SUBJECTS:	Archaeology, History, Science
SKILLS:	Classification, concept formation, inference, cooperative learning
DURATION:	1 class period
CLASS SIZE:	any, smaller is preferred

Objectives: Students will understand that 1) technology changes; and 2) technological change is related to social and cultural change.

Methods: This lesson examines technological and cultural change. The concepts are illustrated using a timeline depicting technological events of the past 150 years. Students then study how new technology influenced lifestyles of Utah's prehistoric people by using the Unit 2 lessons or by visiting a local museum.

Materials: A large piece of butcher paper tacked to a classroom bulletin board. (If you have done Lesson 5 of Unit 1, use the timeline you have already constructed and expand the scale for the last 150 years.)

Vocabulary:

economics - relating to the necessities of life

technology - the body of knowledge used by a group of people to obtain raw materials and convert them into usable objects or products; "know how"

Background: Basic human needs including the need for food and shelter have changed very little throughout the centuries. However, the ways humans have fulfilled these needs have varied considerably. For example, in southeast Utah housing has changed from caves, to pit houses, to sandstone pueblos, to modern frame and brick houses. Transportation has changed from horse drawn vehicles, to automobiles, to airplanes. Cooking was originally done with a campfire, then with a wood or coal burning stove, followed with a gas or electric stove, and now in a microwave oven.

Technological changes are often linked to social and cultural changes. Consider video games. Some of the students may have gone to an arcade a few years ago to play video games. Do most students still go to arcades or do most of them have their own Nintendos at home? Is social interaction different at the arcade than it is at

home? Given the choice which do students prefer - the sociability of the arcade or owning a Nintendo? or both? What are the reasons for their choice?

Only material objects remain in the archaeological record, thus, archaeologists are limited to technological products in their study of past cultures. One can not dig up a language, a kinship system, an economic system, or a religion. The nature of languages, kinship, economics, and religion and how they have changed must be inferred from the material objects that the culture has left behind.

Archaeology provides a long-term view of the relationship between culture and technology. The archaeological record is the only record we have of prehistoric technological changes and how those changes affected culture. For instance, archaeologists can study how a new tool affected a culture over several hundred years. Today insight into possible consequences of a new technology is certainly of relevance to us all. The unique opportunity to study technological changes over long time periods requires the preservation of the archaeological record.

Procedure: Draw a time line on the bulletin board to accommodate approximately 150 years. If you have done Lesson 5 of Unit 1, use the same timeline format, but expand the scale. There will be many events to record so you will need a lot of room on the line. Assign students to find the dates for the events listed below:

1. Year of their birth, their parents, and their grandparents.
2. Major historical events: World War I, World War II, Vietnam War, the first Earth Day, the building of the Berlin Wall
3. Major technological events: the first automobile, the first atomic bomb, the first computer, Sputnik, Apollo moon landing, the first Space Shuttle, the first Nintendo
4. Local events: date the town or city was founded, date their school was built

Place the events on the time line. This exercise will graphically demonstrate the temporal relationships between various cultural, political, and technological events in the students' lives and the recent past. It will also show that the rate of technological development has accelerated rapidly in this century.

Model discussion by using a familiar example, the automobile. Cars and the convenient transportation they provide have affected American culture and behavior in numerous ways: 1) the development of widely scattered specialized stores, 2) great distances between work and home, 3) frequent trips to visit friends and relatives, and 4) driving for pleasure or "Sunday driving". Think about how

much time typical Americans spend in a car each week. In addition, automobiles have changed numerous social practices. Family roles evolve based on who is old enough to drive and who needs transportation. Courtship practices changed when young people had a ready means of being alone. World economics and politics continue to revolve around oil.

Discussion questions:

- Which technological events have affected your life? your parents? your grandparents?
- Which technological events have affected the United States? the World?
- Which technological events seem beneficial? which seem harmful?
- What are some consequences of various inventions eg. nuclear power? gun powder? cars? television?
- Name some possible reasons that the speed of technological development has accelerated in this century.
- What will the next technological event be?

Use technological change as a theme for studying prehistoric cultural change. Two suggested ways to do this are:

1. Using the lessons in Unit 2, examine technological changes that occurred during each cultural period.
2. Visit a local museum. Archaeological exhibits are usually arranged by time period. (It is also possible to examine anthropological or historical exhibits in terms of technological similarities, differences, and changes over time.)

Suggested questions for studying Utah's prehistoric technological and cultural changes:

Paleo-Indian - Why are Paleo-Indian projectile points large in comparison to later styles? (They were attached to a shaft and used for thrusting instead of throwing).

Archaic - How did hunting methods change as a result of the invention of the atlatl? (Animals could be hunted from a greater distance because an atlatl dart can be thrown further and more accurately. Hunting was probably less dangerous than in Paleo-Indian times).

Fremont - How did the domestication of plants change lifeways? (It became necessary to stay in one place while the plants matured. In addition, it was necessary to store the crops for winter and to plant the seeds in spring).

Anasazi - Name some advantages and disadvantages of living in a cliff dwelling. (The dwelling would have been easy to defend from

enemy attacks, however, it would have been dangerous work to haul food, fuel, and tools up and down the cliffs).

Numic - How did the introduction of the horse change the lives of nomadic peoples? (They could travel greater distances, carry more things, and hunt in different ways).

Evaluation: Administer the quiz on technological events of the past 150 years. Have the students write about each of the prehistoric technological events that they examined.

Extensions: Interview an older person about technological changes and how they have affected his/her life. Compare the technology of his or her youth to your own. For example, what was clothing like 50 years ago? What is clothing like now? How do changes in clothing reflect cultural changes?

Have the students bring artifacts from home that represent three generations respectively: their own, their parents', and their grandparents'. It may not be possible for them to bring the actual artifacts, but they can cut pictures from magazines or make drawings. Structure the artifact collections by categories, such as cooking utensils, clothing, and recreational items.

Discuss how the groups of artifacts are the same and how they are different. For example:

1. How were they made?
2. What are they made of?
3. What were they used for?
4. What common need did they satisfy?

1. Name some technological events that have affected your life. Your parents lives. Your grandparents lives. Why?

Me - Nintendo, I play games with my friends.

Parents - jet airplanes provided much faster transportation

Grandparents - television, provided a new kind of entertainment

2. Name some technological events that have affected the history of the United States. The World. Utah.

The automobile has greatly affected the United States because we depend on oil to operate them.

The atomic bomb has affected the relations between nation of the world because of the threat of nuclear holocaust.

Space travel has affected Utah because many Utahns work in rocket production industries.

3. Name some technological events that are beneficial. Some that are harmful.

Beneficial - television, radio, space travel

Harmful - gun powder

4. What are some consequences of three inventions, for example, nuclear fission? gun powder? automobiles? television?

Nuclear fission - atomic bombs, nuclear power

Automobiles - convenient transportation, air pollution

Television - instant transmission of information all over the world, people read less for entertainment

5. What do you think the next technological event will be?

Intergalactic travel

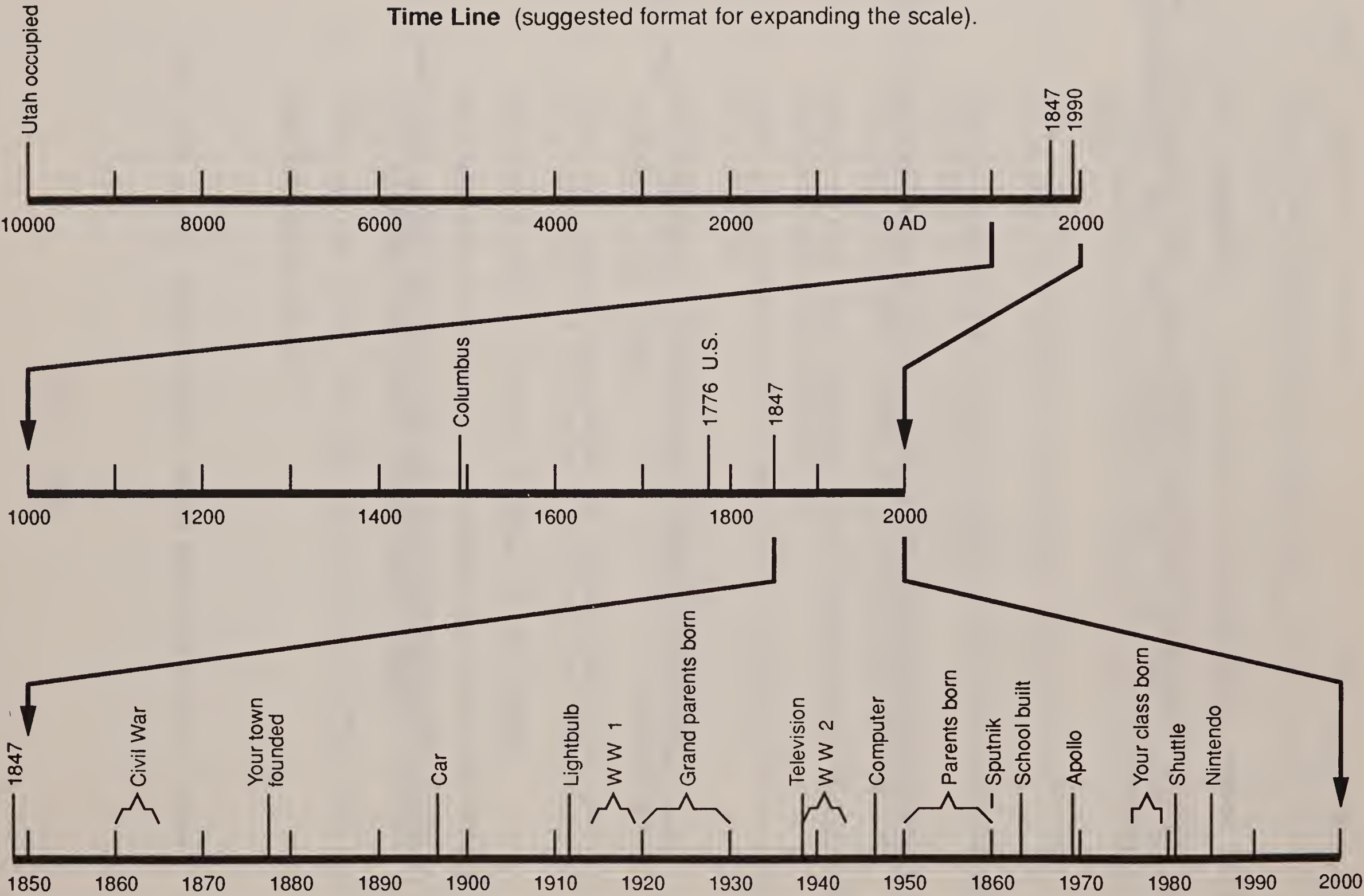
QUIZ Lesson 13 of Unit 3

Name _____

1. Name some technological events and state how they have affected your life. Your parents' lives. Your grandparents' lives.
2. Name some technological events that have affected the history of the United States. The World. Utah.
3. Name some technological events that are beneficial. Some that are harmful.
4. List some consequences of three inventions, for example, nuclear fission? gun powder? cars? television?
5. What do you think the next technological event will be?

Lesson 13 of Unit 3

Time Line (suggested format for expanding the scale).



STRATIGRAPHY AND CONTEXT Lesson 14 of Unit 3 - Studying and Valuing the Past

AGE:	4th - 7th grades
SUBJECTS:	Archaeology, Geology, Earth Science
SKILLS:	Observation, inference, analysis, drawing, cooperative learning
DURATION:	1 class period
CLASS SIZE:	any

Objectives: Students will understand: 1) the law of superposition; 2) that natural and human-made materials settle unto the earth in layers; and 3) that layers (strata) provide archaeologists with temporal and spatial context for the artifacts found within them.

Method: The teacher discusses how archaeological strata are formed and demonstrates strata formation using sediments and a clear container of water. Students analyze strata using copycat pages.

Materials: A clear glass or plastic container and sediments of three sizes: silt, sand, pebbles. Colored aquarium gravel works well for one of the sediments. Copycat pages for each student.

Vocabulary:

context - the relationship artifacts have to each other and the situation in which they occur

diagnostic artifact - an item that is indicative of a particular time and/or cultural group, for example, a site containing an 1875 gold piece indicates occupation after 1875

spatial - involving, or having the nature of space

strata - many layers of earth

stratigraphic dating - determining the age of a stratum by the presence of diagnostic artifacts within it

stratigraphy - the arrangement of layers of earth representing different geologic events

stratum - one layer of earth

temporal - concerned with time

Background: Natural materials such as rocks, soil, and plant and animal remains occur on the earth's surface and can accumulate into

layers. Each layer may be distinguished by its physical characteristics: color, texture, and structure. Similarly materials of human origin are also deposited onto the earth's surface. In archaeological sites natural and human materials occur together in layers. These layers, called strata, form a record of past events that archaeologists analyze and interpret.

The materials deposited first are the oldest and are always found at the bottom of a given stratigraphic section. The most recently deposited materials are the youngest and are always at the top. This concept is known as the Law of Superposition. It always applies except when some type of disturbance has occurred.

Strata in archaeological sites provide archaeologists with temporal and spatial information. All of the artifacts in a given stratum will be of approximately the same age while those in strata above or below will be younger or older respectively.

The Law of Association allows inferences to be made about artifacts, their age, and their context. Simply stated, the Law of Association means that artifacts found together are likely to be of the same approximate age and are related in some way. If a stratum contains charcoal that can be radiocarbon dated (Carbon-14), then the other artifacts within the same stratum are inferred to be of about the same age. This principle allows archaeologists to correlate sites by stratigraphic dating. For instance, a diagnostic artifact in one site is dated by its association with datable carbon. When that same type of artifact occurs at another site, it is inferred to be of the same age, as is the stratum in which it was found.

When an archaeological site is vandalized, knowledge of past cultures is lost forever. Damage to stratigraphy by indiscriminate digging destroys the information that could be obtained under controlled scientific excavation. Cultural resources are protected from "unauthorized excavation, removal, damage, alteration, or defacement" and "trafficking or sale of artifacts" by the Archaeological Resources Protection Act (ARPA) passed by Congress in 1979 and amended in 1988. (See Rock Art 3, Lesson 10 of Unit 3 for a summary of the provisions of ARPA.)

Procedure: Fill a clear plastic or glass container half full of equal amounts of small gravel, sand, and silt. Add water till the container is three-quarters full. Stir or shake the contents until all the sediments are mixed up. Allow the container to stand and the contents to settle out. The three sizes of sediments will form layers (strata). Repeat the agitation/settling process several times to show that it always works the same way. Try adding some artifacts of different materials (e.g., wire, stone, or fiber) and see where they settle in the stratigraphy. Discuss this phenomenon.

The settling chamber illustrates how materials of different size and density will settle out in water. In Utah, some archaeological sites are buried in this manner. Typically sites become buried by other processes such as the accumulation of wind-blown particles or by sediments eroding and covering artifacts located downslope. To help student comprehend the process of gradual sediment accumulation over great spans of time ask them to imagine dust settling in layers on the furniture at home. If no one dusted for 100 years or 1000 years imagine how thick the layer would be. Discuss the various processes that might be involved in covering archaeological sites: flooding, settling of wind-borne sediments, and volcanic eruptions. It may be possible to demonstrate some of these processes in the classroom.

Using the background information, tell the students about the Laws of Superposition and Association, how archaeological sites get buried, how strata are formed, and the importance of stratigraphy in archaeological analysis. Refer to the results of the settling chamber experiment to illustrate the concepts.

Discuss the stratigraphic sections from the three separate sites shown on the Name the Culture copycat page. Each horizontal division represents a stratum. The diagnostic artifacts within the strata indicate the cultural period from which they originated (see Unit 2 lessons). Ask the students to name each culture represented by the diagnostic artifacts. The strata have now been stratigraphically dated by the diagnostic artifacts. Correlate the strata between sites by connecting the horizontal divisions with dotted lines. For example, the Fremont occupation is the most recent at Site 3; it is not represented at Site 2; and the Fremont artifacts are underneath the Numic artifacts in Site 1.

Divide the class into two groups (if the class is large you may have to use four groups). Each group is a team of archaeologists investigating the site. Pass out the copycat page of the complete stratigraphic section to one group and the copycat page of the damaged partial section to the other group. Each group prepares their archaeological report discussing the cultures represented and the changes that took place between cultural periods. What are the differences between the findings of each group? What happens to site data when someone vandalizes a site by digging holes in it and removing artifacts?

Discuss the importance of preserving archaeological sites and the laws protecting them and what to do if you witness someone digging a site. Additional information is in Rock Art 3 (Unit 3, Lesson 10).

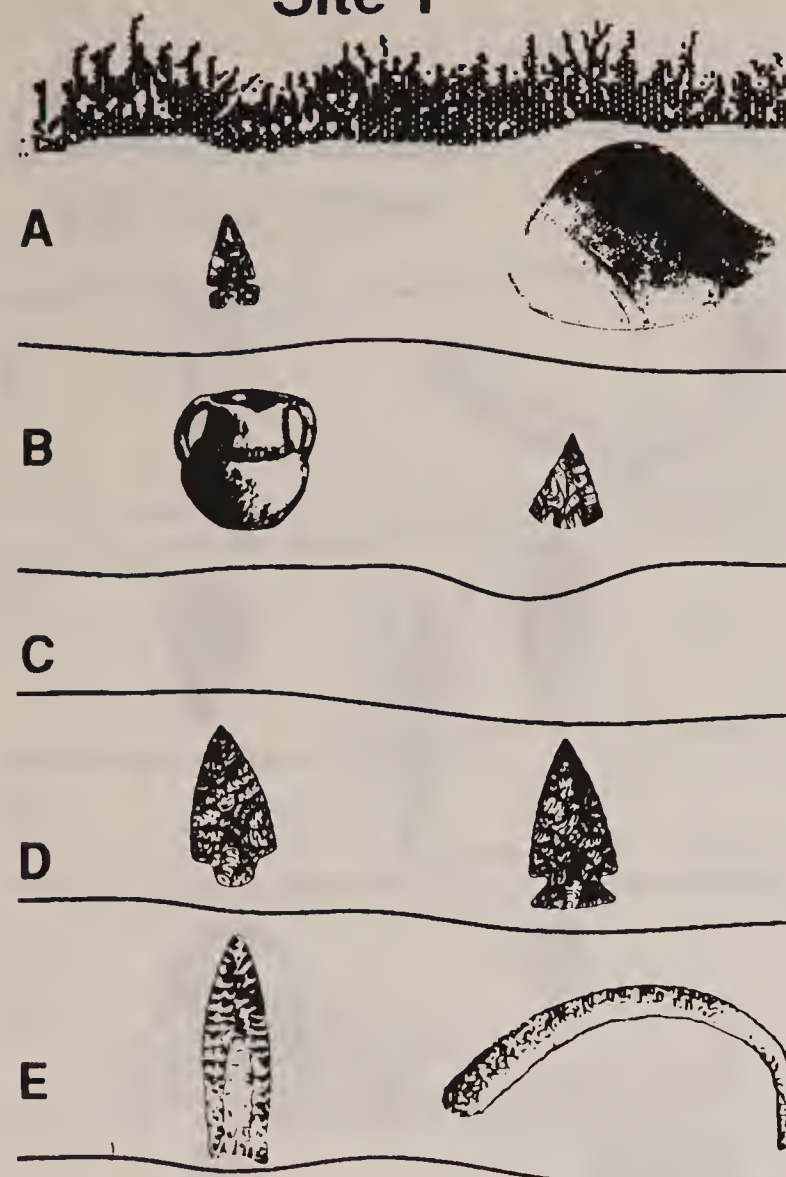
Evaluation: The students submit the Name the Culture copycat page and their archaeological reports for evaluation.

Extensions: Field trip. Examine the stratigraphy of road cuts. Measure and draw the layers on graph paper. Describe the strata by comparing differences in color and texture and other observable characteristics.

If you did not teach Unit 2, divide the class into five groups and assign each group one of the cultures (Paleo-Indian, Archaic, Fremont, Anasazi, Numic/Navajo) as a research project. Have them present their results orally. Make a bulletin board showing a complete Utah stratigraphy with all of the prehistoric cultures represented. (It would be misleading to think that all of the prehistoric cultures are represented at each site in the state. In reality all five are rarely found together.)

Lesson 14 of Unit 3

Site 1



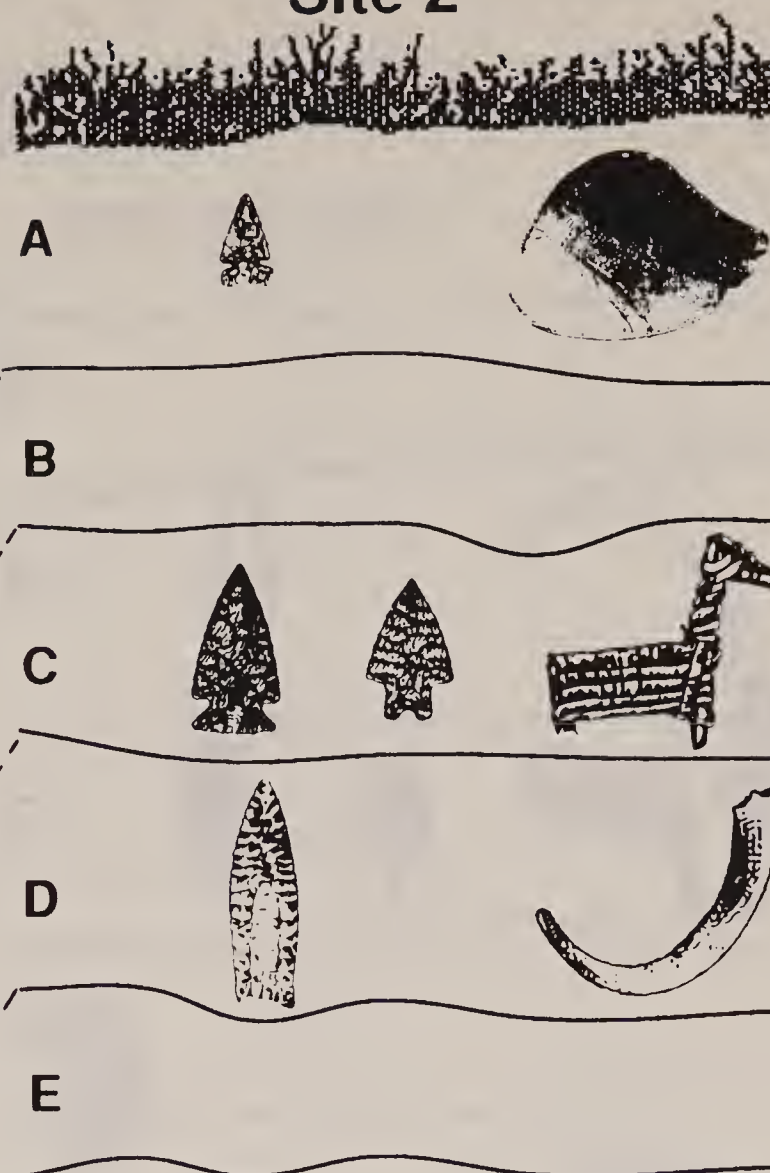
Name the culture.

- A Numic
- B Fremont
- C None
- D Archaic
- E Paleo-Indian

Oldest? Paleo-Indian

Youngest? Numic

Site 2



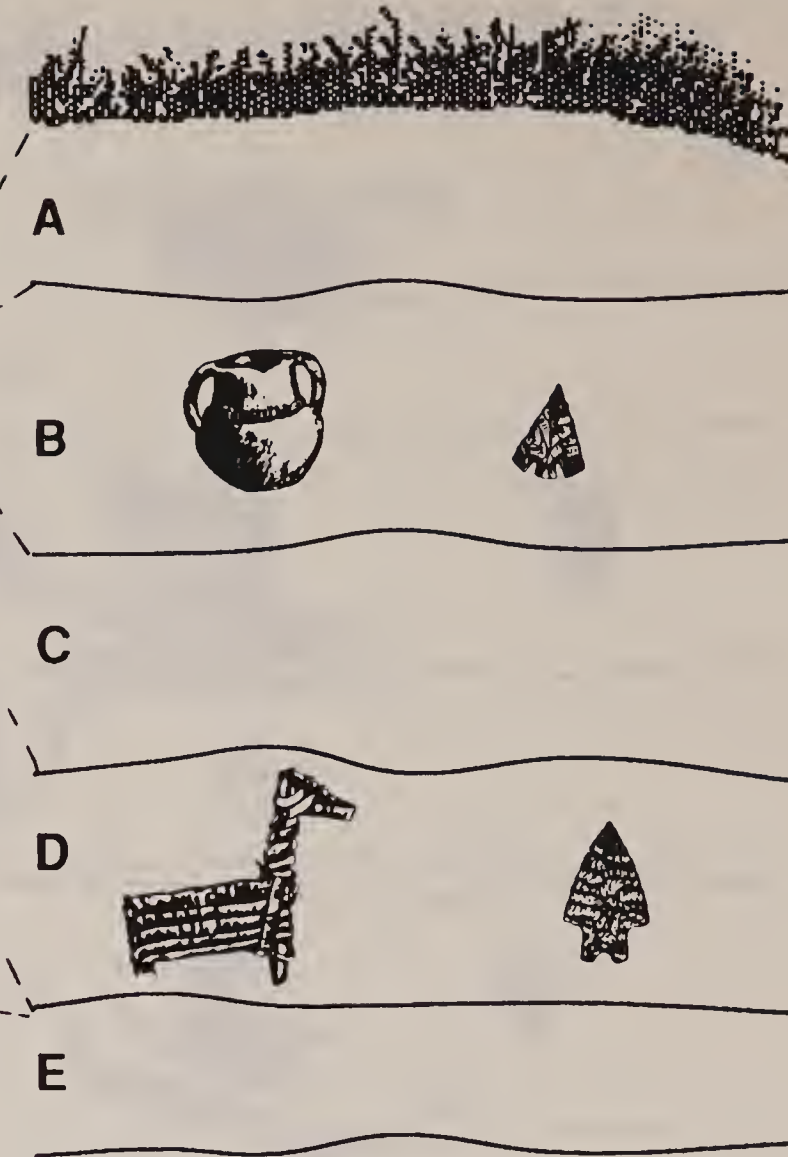
Name the culture.

- A Numic
- B None
- C Archaic
- D Paleo-Indian
- E None

Oldest? Paleo-Indian

Youngest? Numic

Site 3



Name the culture.

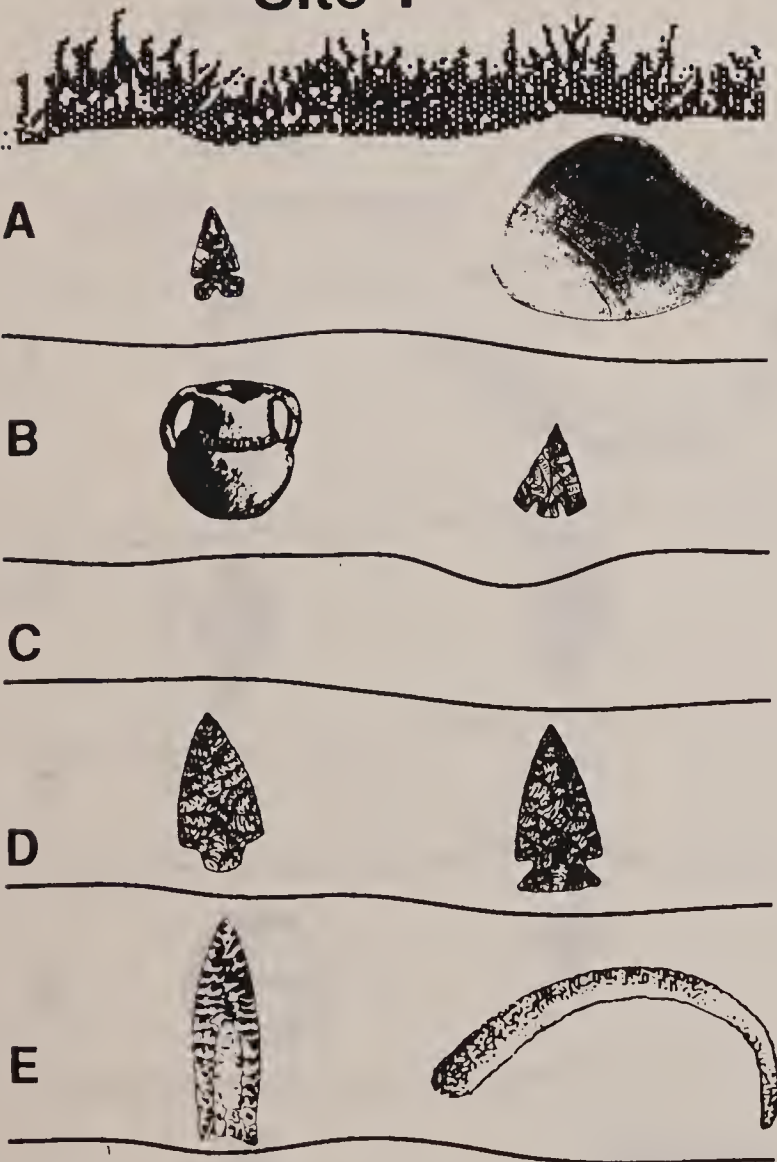
- A None
- B Fremont
- C None
- D Archaic
- E None

Oldest? Fremont

Youngest? Archaic

Lesson 14 of Unit 3

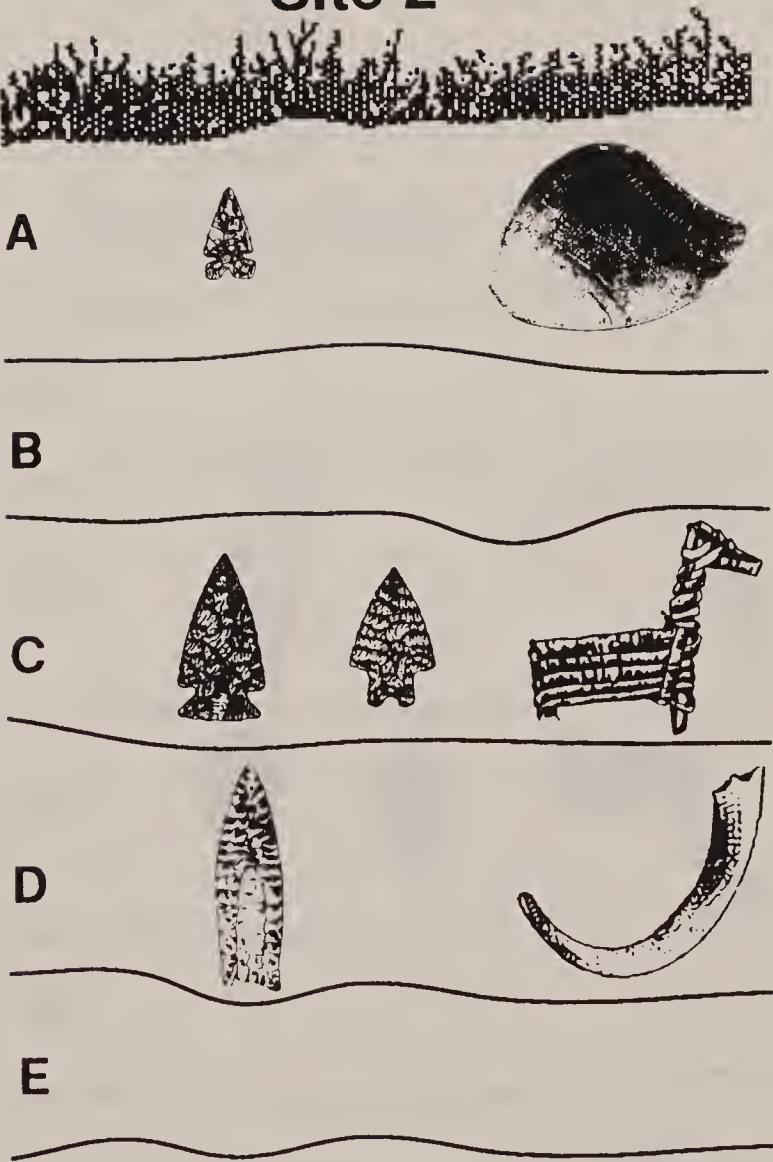
Site 1



Name the culture.

A _____
B _____
C _____
D _____
E _____
Oldest? _____
Youngest? _____

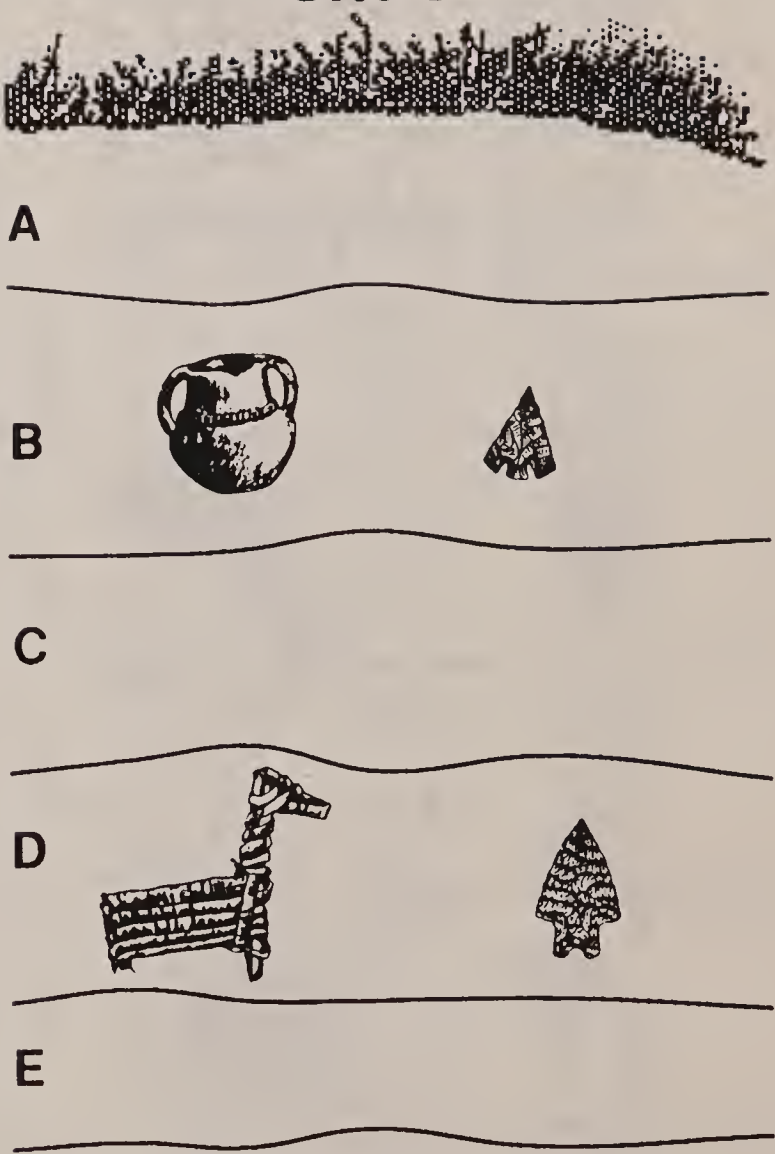
Site 2



Name the culture.

A _____
B _____
C _____
D _____
E _____
Oldest? _____
Youngest? _____

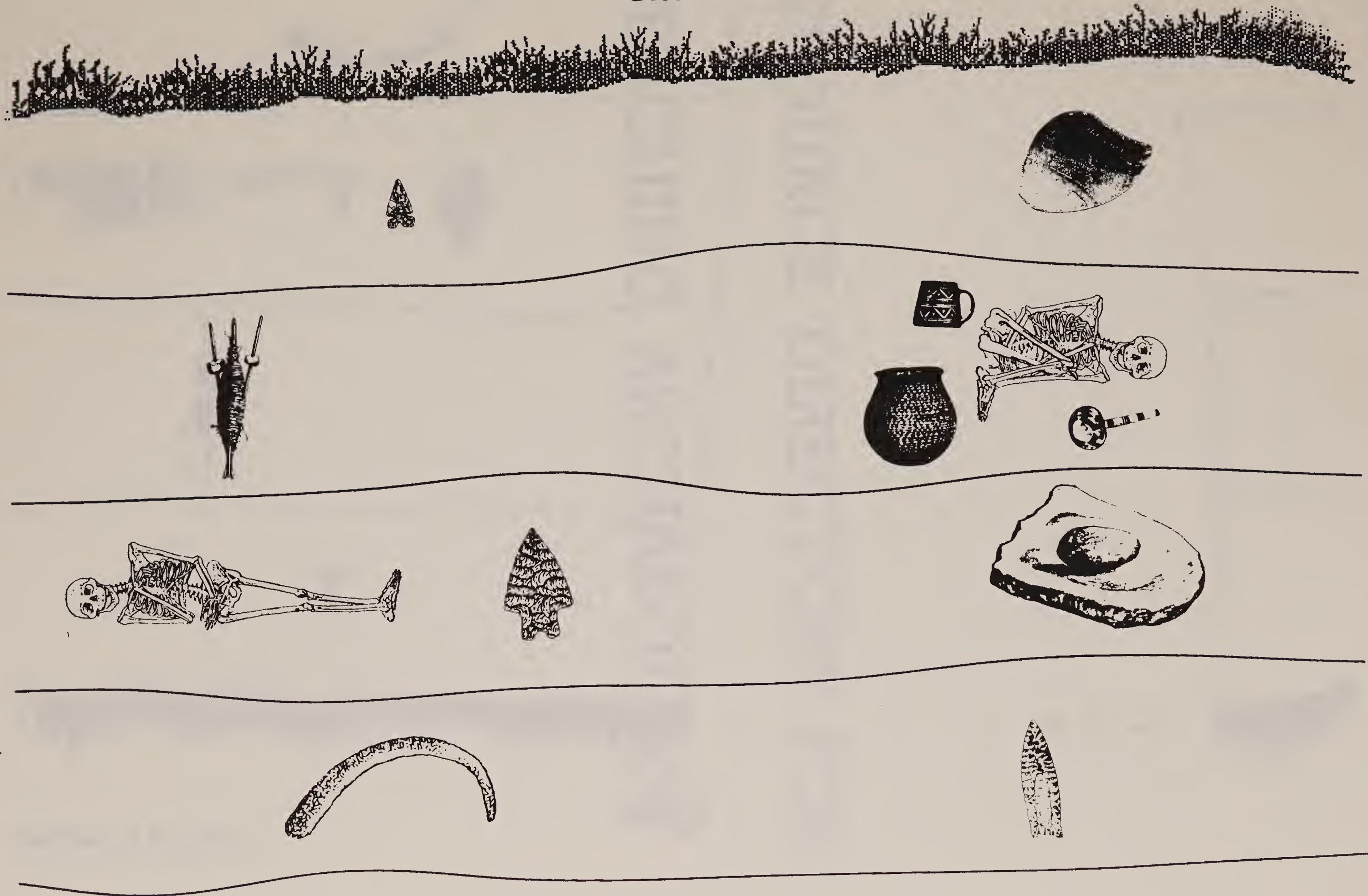
Site 3



Name the culture.

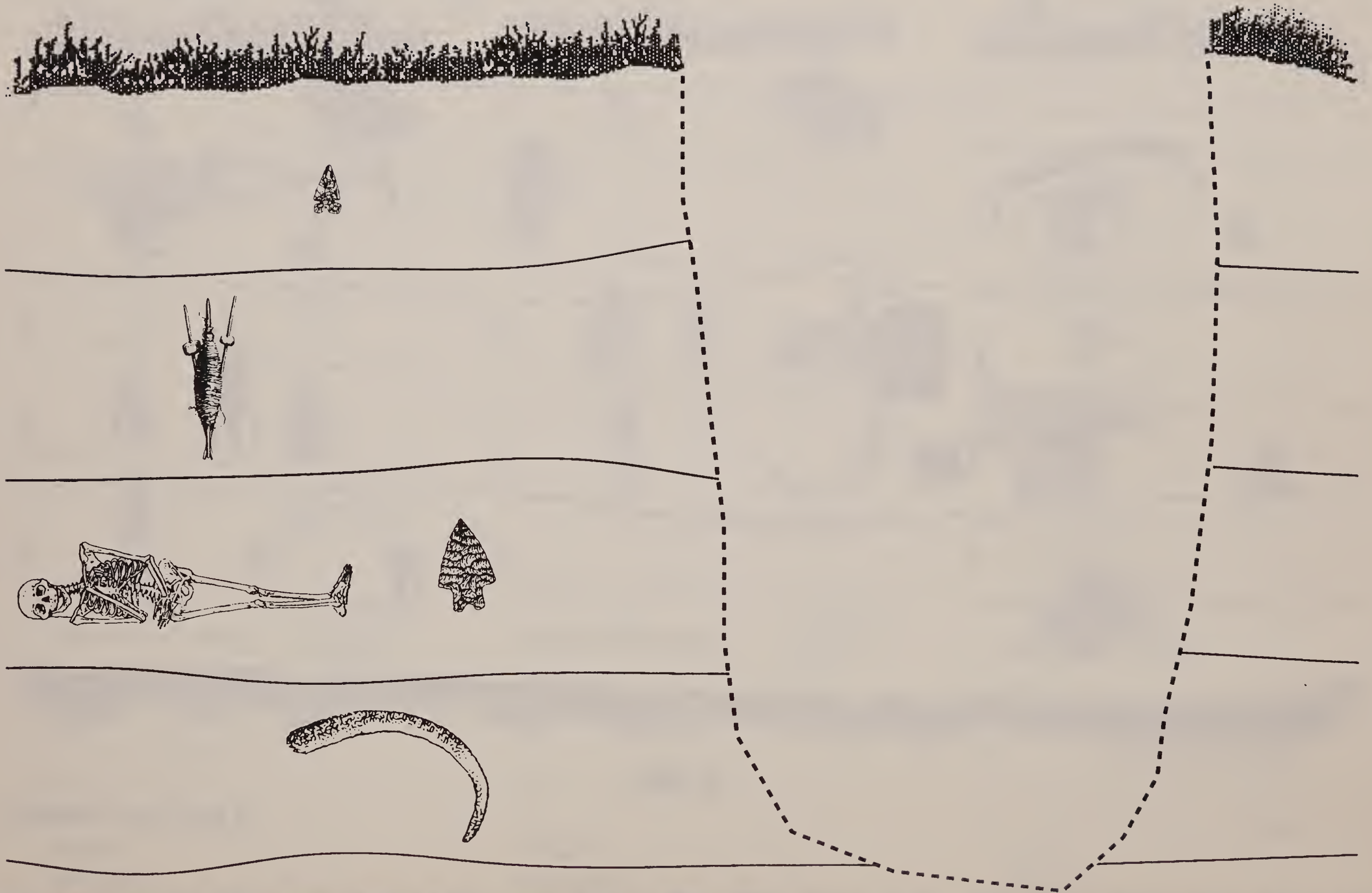
A _____
B _____
C _____
D _____
E _____
Oldest? _____
Youngest? _____

Site A



Lesson 14 of Unit 3

Site A



**RESOURCE DIRECTORY FOR
TEACHING ARCHAEOLOGY**

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RESOURCE DIRECTORY FOR TEACHING ARCHAEOLOGY
September 1990

This directory is a compilation of resources in archaeology which are readily available to Utah teachers. Many other resources of a more general or national scope exist, although they may be more difficult to obtain than those listed here.

For a complete and current list of nationwide resources for archaeological education, consult **Pathways to the Past: An Educator's Guide to Resources in Archaeology**, compiled and edited by K.C. Smith, January, 1990. It is available from the Museum of Florida History, Department of State, R.A. Gray Building, Tallahassee, FL 32399-0250, phone 904-488-1484.

CURRICULA AND TEACHERS GUIDES

Indian Education Advisory Committee, editors
n.d. A Guide for Teachers: American Indians of Utah. Utah
State Board of Education, Salt Lake City, UT.

Resource guide for Utah Indian education.

McNutt, Nan
1988 Project Archaeology: Saving Traditions. Sopris West,
Longmont, CO.

P.A.S.T. is a middle school curriculum (grades 6-8) consisting of three units: The Artifact, The Site, The Culture. It includes a teacher's guide, three student field notebooks, a game, and filmstrip. Related artifact kits can be ordered. For information contact:

Sopris West
1140 Boston Avenue
Longmont, CO 80501
(303) 651-2829

Riley, Doloris and Wil Numkena
1988 A Teacher's Guide for the Maps and Charts Series: Conquest of Indian America. Utah State Office of
Education, Salt Lake City, UT.

Learning objectives based on the maps and charts series. Includes activities, additional resources, and evaluation of student learning.

Utah State Office of Education
n.d. Ethnic Folk Artists and Presenters for Multicultural Infusion of the Core Curriculum. Utah State Board of
Education, Salt Lake City, UT.

A guide to requesting and using multicultural activities in the classroom. Resources include Native American artists and presenters, lesson plans, and cultural packets. Available from:

Utah State Office of Education
500 South 250 East
Salt Lake City, UT 84111
(801) 538-7695

Zimmerman, Mary Ann

1987 Utah Prehistory: Social Studies and Talent Training,
Fourth Grade. Jordan School District, Sandy, UT.

1987 Utah Prehistory: Social Studies and Talent Training,
Seventh Grade. Jordan School District, Sandy, UT.

Illustrated books about Utah's prehistory, written for teachers by a teacher. Both levels include activities for an independent study unit. The volumes are available by mailing \$7.50 for the fourth grade volume and \$10.00 for the seventh grade volume plus 5 percent for postage and handling to:

JoAnn Seghini, Director of Curriculum
Jordan School District
9361 South 300 East
Sandy, UT 84070-2998
(801) 565-7100 ext. 161 (Curriculum Department)

ARCHAEOLOGY TEACHING KITS

1. The Utah Statewide Archaeological Society has developed a teaching kit containing slides, representative artifacts from Utah's prehistoric periods, background materials, and a guide. The following organizations have teaching kits, and some are available for loan:

Utah Division of State History
Kevin Jones
300 Rio Grande
Salt Lake City, UT 84101
(801) 533-4563

Kits checked out to schools and other groups by reservation. Refundable deposit of \$25.00 required.

Bureau of Land Management
Richfield District
La Mar Lindsay
150 E 900 N
Richfield, UT 84701
(801) 896-8221

Contact BLM office for information

Bureau of Land Management
Price River Resource Area
Blaine Miller
900 N 700 E
PO Drawer AB
Price, UT 84501
(801) 637-4584

Contact BLM office for information

Bureau of Land Management
Arizona Strip Office
Rick Malcomson
225 Bluff Street
St. George, UT 84770
(801) 628-4491

Presentations offered using kit as teaching aid.

Edge of the Cedars State Park
Winston Hurst
PO Box 788
Blanding, UT 84511
(801) 678-2238

Contact Edge of the Cedars State Park for information.

Bureau of Land Management
Moab District
Bruce Louthan
PO Box 970
Moab, UT 84532
(801) 259-6111
Contact BLM office for information.

Utah Statewide Archaeological Society
c/o Keith Greenhalgh
695 W 3750 N
Ogden, UT
(801) 782-4075
Presentations offered using kit as teaching aid.

Bureau of Land Management
Salt Lake District
Shelley Smith/Diana Christensen
2370 S 2300 W
Salt Lake City, UT 84119
(801) 977-4357/977-4358
Presentations offered on archaeology as a career and
archaeological methods, using kit as teaching aid.

Bureau of Land Management
San Juan Resource Area
Dale Davidson
435 North Main
Monticello, UT 84535
(801) 587-2141
Contact BLM office for information.

Price School District
c/o Margene Hackney
435 Rose Avenue
Price, UT 84501

Department of Sociology, Social Work, and Anthropology
Steve Simms
Utah State University
Logan, UT 84322-0730
(801) 750-1277
\$10.00 fee for 5 days use; proceeds deposited in
anthropology scholarship fund for students.

Bureau of Land Management
Utah State Office
Jeanne Moe
324 S. State Street, Suite 301
PO Box 45155
Salt Lake City, UT 84145-0155
(801) 539-4286

Presentations offered on prehistory and archaeological methods using the kit as a teaching aid.

2. The Utah Museum of Natural History kit contains representative artifacts from Utah's prehistoric periods, figures illustrating artifacts and archaeological techniques, and a teacher's guide including background materials and classroom activities. For more information about the kits contact:

Utah Museum of Natural History
University of Utah
Salt Lake City, UT 84112
Contact: Marlene Lambert, (801) 581-4887

Kits are located at:

Northeastern Utah Educational Service Center
Roger B. Brown
755 South Main
Heber City, UT 84032
(801) 654-1921

Southwest Educational Development Center
Willard Bass
1552 W 200 N
Cedar City, UT 84720
(801) 586-2865

3. The Utah State Office of Education, Indian Education, has recent Indian artifacts for loan, including a miniature weaving frame, pottery, baskets, a cradle board, sand paintings, and more. An order form is included in the "Media" section of this directory.

Utah State Office of Education, Indian Education
Wil Numkena
500 S 250 E
Salt Lake City, UT 84111
(801) 538-7645

MEDIA RESOURCES

National Geographic: Educational Services Catalog

Catalog of learning kits, filmstrips, books, computer software, films, and videos available from the National Geographic Society. Free. Call 1-800-638-4077 or write to the National Geographic Society, PO Box 2895, Washington, D.C. 20077-9960.

VIDEO CASSETTES:

Our Vanishing Heritage: Archaeological Vandalism in Utah.

12 minutes, late elementary through secondary school. Reviews archaeological vandalism problem from the archaeologist's point of view. Available for \$40.00 from:

2050 Media
2636 W. 34th Street
Denver, CO
(303) 458-6482

or

2050 Media
PO Box 906
Farmington, UT
(801) 451-0298

What Price the Past?

50 minutes, late elementary through secondary school. Reviews Utah's archaeological vandalism problem from several points of view: the archaeologist, the law enforcement ranger, the digger, the businessman, and the Native American. Available for \$20.00 from:

KSL-TV
55 N 300 W
Salt Lake City, UT 84103
(801) 575-5555

Sun Dagger

30 minutes, late elementary through secondary school. Discusses the Anasazi Sun Dagger, an astronomical observatory on Fajada Butte, New Mexico. Depicts the ingenuity and scientific sophistication of the Anasazi and archaeologists' attempts to interpret the structure. Available on loan from:

Utah Museum of Natural History
University of Utah
President's Circle
Salt Lake City, UT 84112
(801) 581-4887

Navajo

Navajos tell their own story of survival in a harsh desert environment. Available on loan from the Utah Museum of Natural History.

UTAH STATE OFFICE OF EDUCATION MATERIALS:

Media materials on Indian studies are available to schools from the Utah State Office of Education, Indian Education. These materials can be used as supplemental resources in the study of American Indian history and culture. A film and artifact check out form follows the list of media resources.

Indian Education
Utah State Office of Education
Wil Numkena
500 S 250 E
Salt Lake City, UT 84111
(801) 538-7645

List of media for loan:

16 mm FILMS:

1. More Than Bows and Arrows (58 minutes)

Focuses on contributions the American Indians have made toward the development of our nation. Areas of contributions covered are agriculture, medicine, government, architecture, art, and entertainment. (Grades 1-12)

2. North American Indians Today (30 minutes)

Focus is on Indians who live in an urban area and try to maintain their Indian cultural ties.

VIDEO CASSETTES (3/4" or 1/2")

1. Spirit Runner (15 minutes)

Spotlights the Indian spirit in sports and athletics. Cameo appearance by U.S. Olympic Gold Medalist, Billy Mills. (Grades 1-12).

2. Navajo (29 minutes)

Focuses on Navajo tribal history, culture and traditions, plus the compromising of two cultures. (Grades 1-12)

3. Mother Corn (28 minutes)

Focuses on the spiritual significance and relationship of corn to the Pueblo Indian culture, traditions, and everyday life. (Grades 1-12)

4. Contributions of American Indians (30 minutes)

Focus is on how and what American Indians have contributed to the development of our nation.

5. Native American Series

- a. **Heritage** - A broad overview of early Native American Indian life through the use of songs, prayers, and legends.
- b. **Voices** - Dramatic interpretation of significant oratory from Indian leaders, both past and present.
- c. **The Way** - A discussion of philosophical and religious thoughts by Indian religious leaders.
- d. **The Family** - A dramatization of Iroquois family life, both past and present.
- e. **Treaties** - An examination of the significance of Indian treaties, both past and present.
- f. **Survival** - An interview with Northwest Coast activists Hank Adams and Marlon Brando, focusing on the fishing rights controversy in Washington State.
- g. **Expressions in Art** - An overview of Indian art, focusing on famous Acoma potter Lucy Lewis and the Santa Fe Institute of American Indian Art.
- h. **Two Worlds** - Examines Indian survival in the cities, focusing on an Indian family in Los Angeles.
- i. **Powerless Politics** - Examines the legislative and political aspects of Indian life, both past and present.
- j. **Stereotypes** - Examines Indian stereotypes in music, film and literature. Guests are Buffy Sainte-Marie and Floyd Westerman.

6. Hopi: Songs of the Fourth World (58 minutes)

Provides insight into the Hopi Indian culture from the insider's perspective. The philosophies and concepts shared in the film establish why the Hopi culture is still intact and has such a strong influence on the Hopi way of life. It captures images of Hopiland, a farmer, grandmother, family, a potter, a weaver, and an artist.

7. Walking with Grandfather/Great Wolf and Little Mouse Sister
(25 minutes)

- a. **Walking with Grandfather** (10 minutes) is a presentation on the ecological concept of interdependence, that Mother Earth and the plants, animals, and humans are dependent on each other in maintaining a balance of ecology. (Grades 1-6)
- b. **Great Wolf and Little Sister Mouse** (15 minutes) focuses on the values of sharing and helping. The main characters include a wolf and mouse who strengthen each other through sharing and helping. (Grades 1-6)

SLIDE PRESENTATIONS

Circles of Life

Focus is on traditional art and life of the Plains Indians. Includes a cross-section of art objects made by the Native American inhabitants of the Great Plains regions. Forty slides and cassette. (Grades 1-12)

FILMSTRIPS

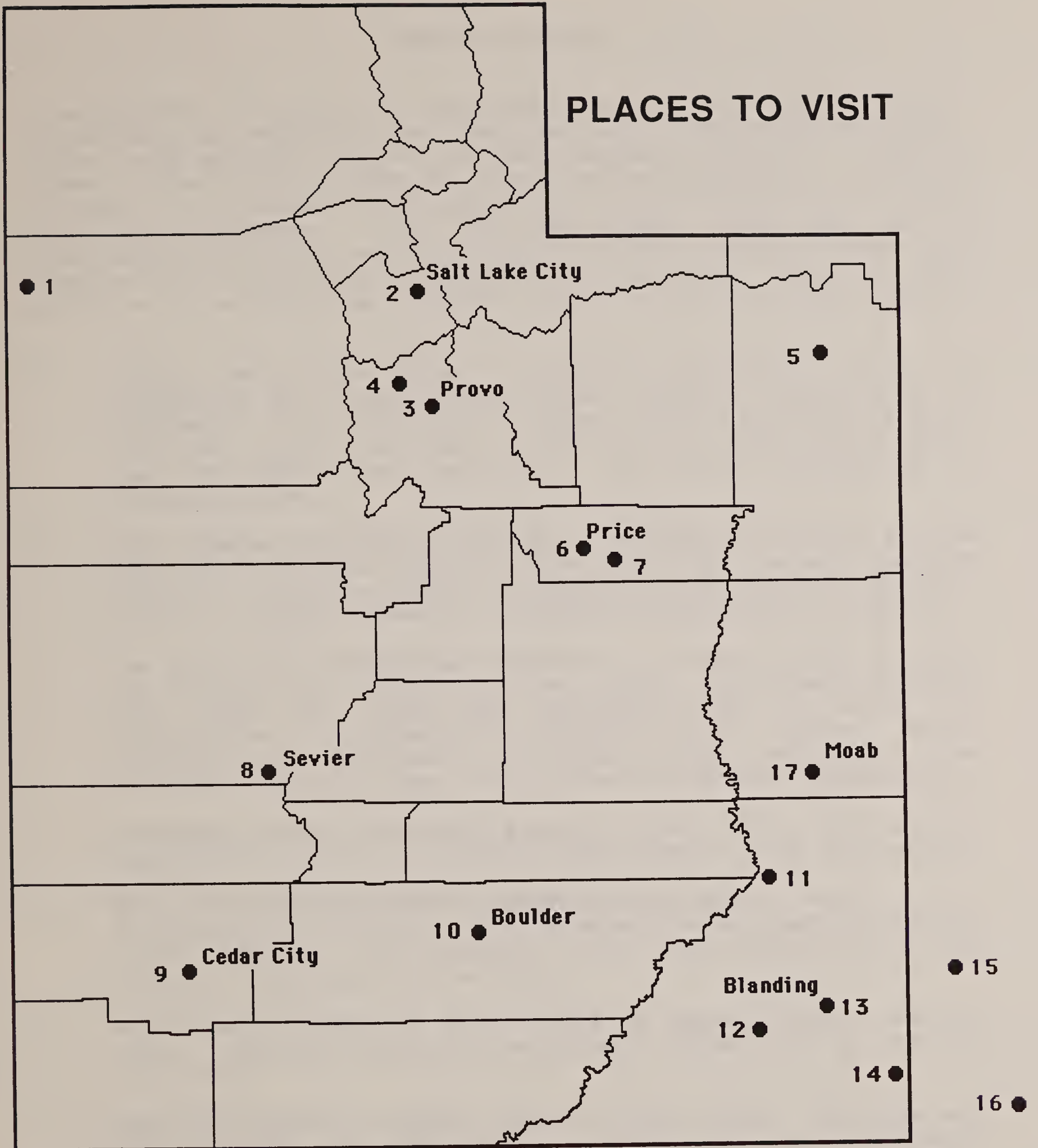
1. Utah's Native American Indians (20 minutes)

Focuses on the five Indian tribes which are native to Utah, their reservation areas, historical briefs, current status and future. Purchase price: \$3.00. Comes with cassette. (Grades 5-12)

2. Who Am I? (15 minutes)

A role model presentation focusing on prominent and successful Indian persons in various occupations. Comes with cassette. (Grades 1-12)

PLACES TO VISIT



● Numbers on the map correspond to the list on the following page.

PLACES TO VISIT

Listed below are places of archaeological interest which are easily accessible by vehicle. The list includes archaeological sites, parks, and museums in Utah and Southwestern Colorado. Many of these places provide special programs or materials for school groups. Call ahead and schedule your class fieldtrip with site and museum managers. There are many other sites that may be educational for your school group to visit; however, most will require extra logistic preparations. Contact land managing agencies for suggestions on other places to visit in your area.*

1. **Danger Cave State Park** - Located immediately north of Interstate 80 in the Silver Island Mountain Range east of Wendover, Utah. An Archaic campsite and dwelling in a cave inhabited 11,500 years ago. Visitors are asked not to enter the cave due to ceiling spall. No on-site facilities or interpretation.
2. **Utah Museum of Natural History** - President's Circle at the University of Utah campus in Salt Lake City. Natural history displays, dioramas, and artifacts exhibiting Paleo-Indian, Archaic, Fremont, Anasazi, Shoshonean and Navajo cultures.
3. **The Museum of Peoples and Cultures** - Located on the Brigham Young University campus in Provo, Utah. The Museum includes both long- and short-term exhibits some of which are interactive. Collections emphasize six regions: Meso-American, the Southwest, the Great Basin, Polynesia, the Mediterranean-Near East, and Historical Western Archaeology.
4. **Hutchings Museum of Natural History** - Lehi, Utah. Utah County prehistoric artifact collection and historic gun collection.
5. **Utah Field House of Natural History State Park** - Vernal, Utah. Collections on display include prehistoric artifacts of Paleo-Indian, Archaic, and Fremont origin and protohistoric and historic artifacts of Ute origin.
6. **Prehistoric Museum of the College of Eastern Utah** - Price, Utah. Displays include an excellent collections of Fremont artifacts.
7. **Nine Mile Canyon** - Located east of Price, Utah. Numerous and well-reserved rock art panels, primarily of Ute and Fremont origin. Most of the canyon bottom land is privately owned. No on-site facilities or interpretation.

8. **Fremont Indian State Park** - Visitor Center and Museum located 13 miles south of Richfield, Utah, in Clear Creek Canyon near Interstate 70. Westbound travelers take Sevier Junction Exit 22. East bound travelers take Farm Exit 17. The Park was established as a result of the excavation of Five Finger Ridge, the largest excavated Fremont site in Utah. The Park features rock art, nature trails, and a pithouse and the museum exhibits many Fremont artifacts.
9. **Southern Utah State College Museum** - Located at Southern Utah State College campus. Exhibits are mostly of Virgin Anasazi artifacts.
10. **Anasazi Indian Village State Park** - Visitor center and museum located in Boulder, Utah, on Utah Highway 12. Eleven pithouses and 67 surface rooms are partially excavated. The site exhibits one of the most northern occupations of the Anasazi into the Fremont cultural area. Museum includes a small collection of artifacts and dioramas.
11. **Canyonlands National Park and Arches National Park** - Both parks are located near Moab, Utah. Canyonlands Visitors' Center presents information on nature and archaeology. Roadside Ruin, an interpreted site, and the Cave Springs Cowboy Camp, an interpreted loop trail are located in the Needles District. Arches Visitors' Center has interpretive displays.
12. **Natural Bridges National Monument** - Located approximately 30 miles west of Blanding, Utah. The archaeological sites on the Natural Bridges Loop Trail and the Horse Collar Ruin trail are interpreted.
13. **Edge of the Cedars State Park Museum and Pueblo** - Visitor Center and museum, Blanding, Utah. A large Anasazi site with 10 kivas and 75 surface rooms partially excavated. Some dwellings and kivas are partially restored. The Museum houses an impressive collection of Anasazi artifacts with displays and interpretation.
14. **Hovenweep National Monument** - Five groups of distinctive tower ruins located on McElmo Route, Colorado and Utah. Headquarters and ranger station with exhibits are located at Square Tower Ruin. Open 8-5 daily, year round. Nearby campground is \$3.00 per night. Four other tower groups (Cutthroat Castle, Holly, Hackberry, and Cajon) are near Square Tower Ruin. Maps are available at ranger station.

15. **Anasazi Heritage Center** - Located on Colorado Highway 184 near Dolores, Colorado. Visitor center, archaeological sites, and museum completed in 1988 as part of the Dolores Archaeological Project. Museum displays artifacts recovered from project excavations and interpretation of regional prehistory, archaeological methods, and analytical procedures. Partially excavated and restored Escalante Ruins located on the grounds. Interactive displays and school group programs available.
 16. **Mesa Verde National Park** - Located on Colorado Highway 160 about ten miles east of Cortez, Colorado. Contains some of the most spectacular Pueblo II-III cliff dwellings in the Southwest. Some earlier pueblo ruins are found on the mesa tops. Museum and visitor center display Anasazi artifacts.
 17. **Dan O'Laurie Museum** - Moab, Utah. Exhibits on prehistoric archaeology, especially the Anasazi, mining history, geology, and paleontology.
- * Information on other archaeological sites to visit in Utah is listed in the following brochures: "Archaeological Heritage of Utah", "Anasazi Sites in the Four Corners Region", and "Utah's Trail of the Ancients Map and Guide". The brochures are available from the Bureau of Land Management, Forest Service, National Park Service, Utah Division of Parks and Recreation, and Utah Division of State History.

MUSEUMS

1. Utah Museum of Natural History
University of Utah
Salt Lake City, UT 84112
(801) 581-4887
2. The Museum of Peoples and Cultures
105 Allen Hall
Brigham Young University
Provo, UT 84602
(801) 378-5435
3. Hutchings Museum of Natural History
685 North Center Street
Lehi, Utah 84043
(801) 768-8710
4. College of Eastern Utah Prehistoric Museum
College of Eastern Utah
400 N 451 E
Price, UT 84501
(801) 637-5060
5. Southern Utah State College Museum
Southern Utah State College
351 W. Center Street
Cedar City, UT
(801) 586-7870
6. Anasazi Indian Village State Park
PO Box 393
Boulder, UT 84716-0393
(801) 335-7308
7. Edge of the Cedars Museum
660 West 400 North
Blanding, UT 84511-0788
(801) 678-2238
8. Hovenweep National Monument
c/o Mesa Verde National Park
Mesa Verde, CO 81330
(303) 529-4465
9. Anasazi Heritage Center
27501 Highway 184
Dolores, CO 81323
(303) 882-4811

10. Mesa Verde National Park
Mesa Verde, CO 81330
(303) 529-4461

11. Dan O'Laurie Museum
118 East Center Street
Moab, UT 84532
(801) 259-7985

SPEAKERS

1. Archaeologists

Some archaeologists will visit your school and present a program about archaeology. Contact your local museum, college or university, or government agencies, such as the Bureau of Land Management, Forest Service, National Park Service, and the Utah Division of State History.

Members of the Utah Statewide Archaeological Society will also visit the classroom and give presentations about archaeology. Contact USAS at the Utah Division of State History, 300 Rio Grande, Salt Lake City, UT 84101, phone (801) 533-4563, for the USAS chapter nearest you.

2. American Indians

Contact tribal governments or museums near you to request Indian people to speak to your students. The Utah State Office of Education maintains a list of ethnic minority folk artists and presenters, accessed by calling (801) 538-7640, or Wil Numkena, Indian Education, (801) 538-7645. There is a \$25.00 charge for a speaker.

3. Utah Rock Art Association

Members of the Utah Rock Art Association will go to schools with prepared slide shows and presentations on rock art in Utah. Call Ray Daly, (801) 966-7326, for further information.

EDUCATIONAL OPPORTUNITIES

Opportunities for "hands-on" archaeological experience and education are available for both teachers and students. Most of the organizations listed below charge for their service. Their inclusion on this list does not constitute an endorsement of their programs; rather the lists is provided strictly for your information. In addition, to the institutions listed below, museums, state and federal agencies, and universities, may accept volunteers to assist with field and laboratory projects.

1. Canyonlands Field Institute
PO Box 68
Moab, UT 84532
(801) 259-7750

Educational fieldtrips for adults and families. College credit available for some of the workshops and seminars.

2. Crow Canyon Archaeological Center
23390 County Road K
Cortez, CO 81321
1-800-422-8975

Offers a variety of fieldwork and laboratory research opportunities in archaeology and archaeobotany. For adults, teachers, families, and high school students.

3. Four Corners School
East Route
Monticello, UT 84535
(801) 587-2859/1-800-525-4456

Outdoor workshops and seminars in archaeology and anthropology.

4. Kelly Place
14663 County Road G
Cortez, CO 81321
(303) 565-3125

Instruction and experience in preservation and stabilization of on-site prehistoric ruins.

5. Utah Museum of Natural History
University of Utah
Salt Lake City, UT 84112
(801) 581-4887

Offers museum tours, docent training, teacher workshops, kits, outreach programs, seminars, speakers, and on-going classes for children and adults, some involving field trips. College credit and teacher recertification credit may be obtained for some classes.

6. Utah Statewide Archaeological Society
State Office
300 Rio Grande
Salt Lake City, UT 84101
(801) 533-4563

A three-level archaeological certification course is offered through USAS and teacher recertification credit can be arranged. Upon completion of the course USAS offers archaeological experience through participation in surveys and excavations conducted under the direction of professional archaeologists. Also opportunities for laboratory work and research.

7. White Mesa Institute
CEU/San Juan Campus
639 W 100 S (50-1)
Blanding, UT 84511
(801) 678-2201 or 451-2684

Outdoor educational opportunities with archaeological and anthropological experts. Some events are co-sponsored by other institutions.

RECOMMENDED READING - ADULT

Books

Ambler, J. Richard
1977 The Anasazi. Museum of Northern Arizona, Flagstaff, AZ.

Well-illustrated introduction to Anasazi prehistory and culture.

Barnes, F. A.
1982 Canyon Country Prehistoric Rock Art. Wasatch Publishers, Inc., Salt Lake City, UT.

Rock art of the Four Corners region.

Castleton, Kenneth D., M.D.
1984 Petroglyphs and Pictographs of Utah, Volume One: The East and Northeast. Utah Museum of Natural History, Salt Lake City, UT.

1987 Petroglyphs and Pictographs of Utah, Volume Two: The South, Central, West, and Northwest. Utah Museum of Natural History, Salt Lake City, UT.

Comprehensive overview of Utah rock art.

Cordell, Linda S.
1984 Prehistory of the Southwest. Academic Press, Inc., Harcourt Brace Jovanovich, Publishers, New York.

Technical overview of southwestern archaeology and prehistory from Paleo-Indian to Protohistoric times.

Cordell, Linda S. and Dewitt Jones
1985 Anasazi World. Graphic Arts Center Publishing Company, Portland, OR.

Reveals through color photographs and text the most recent information on the Anasazi people and why they disappeared.

Fagan, Brian M.
1981 In the Beginning. Little, Brown and Company, New York.

Comprehensive introduction to the discipline of archaeology.

Fagan, Brian M.

1983 Archaeology: A Brief Introduction. Little, Brown and Company, New York.

Good introductory text about the discipline of archaeology.

Jennings, Jesse D.

1978 Prehistory of Utah and the Eastern Great Basin. University of Utah Anthropological Papers, No. 98. Salt Lake City, UT.

Overview of Utah and Great Basin prehistory. Emphasis on Archaic Period and Fremont developments.

Lister, Robert H. and Florence C. Lister

1983 Those Who Came Before: Southwestern Archaeology in the National Park System. Southwest Parks and Monuments Association, Tucson, AZ.

Prehistory of the Southwest. Gives viewpoints of traditional cultural groups. Discusses the 28 National Parks and Monuments in the Southwest.

Madsen, David B.

1989 Exploring the Fremont. Utah Museum of Natural History, University of Utah, Salt Lake City, UT.

Recent and thorough overview of the Fremont. Informative and very readable. Also recommended for upper grade levels.

Petit, Jan

1982 Utes: The Mountain People. Century One Press, Colorado Springs, CO.

Describes the history and culture of the Utes.

Schaafsma, Polly

1971 "The Rock Art of Utah". Papers of the Peabody Museum of Archaeology and Ethnology, Volume 65. Harvard University, Cambridge, MA.

Regional guide to the prehistoric rock art of Utah. Numerous photographs and drawings.

Wheat, Margaret M.

1967 Survival Arts of the Primitive Paiutes. University of Nevada Press, Reno, NV.

Well-illustrated and fascinating book about techniques of manufacturing many types of tools and implements. Includes a discussion of Paiute culture. Adaptable for class projects.

Journals and Magazines

American Antiquity. Journal of the Society for American Archaeology, 1703 New Hampshire Avenue, N.W., Washington, D.C. 20009. Professional technical journal.

Anthro Notes. National Museum of Natural History Newsletter for Teachers. Free booklets on teaching anthropological topics, including archaeology. Published three times a year. To be added to the mailing list contact Ann Kaupp, Public Information Office, Department of Anthropology, Stop 112, Smithsonian Institution, Washington, D.C. 20560.

Archaeology. Popular publication of the Archaeological Institute of America, 15 Park Row, Suite 1732, New York, NY 10038. Each year the May/June issue features a travel guide of sites open to the public.

National Geographic. Popular publication of the National Geographic Society, PO Box 2895, Washington, D.C. 20077-9966. Especially useful for teaching about other cultures. Often has articles on archaeological topics.

Natural History. Popular publication of the American Museum of Natural History, Central Park West at 79th Street, New York, NY 10024. Many issues have articles about anthropology and archaeology.

Smithsonian. Popular publication of Smithsonian Associates, 900 Jefferson Drive, Washington, D.C. 20560. Often includes articles about archaeology and anthropology.

Utah Archaeology. Published annually by the Utah Statewide Archaeological Society and the Utah Professional Archaeological Council, 300 Rio Grande, Salt Lake City, UT 84102.

RECOMMENDED READING - CHILDREN

Aliki

1976 Corn Is Maize, the Gift of the Gods. Thomas Crowell, New York.

Science book on the history of corn. For primary reading levels.

1977 Wild and Woolly Mammoths. Thomas Crowell, New York.

Science book about Ice Age mammoths. For primary reading levels.

Bateman, Walter L.

1970 The Navajo of the Painted Desert. Beacon Press, Boston.

A collection of Navajo stories and mythology. Shows several little known aspects of the culture. For primary reading levels.

Baylor, Byrd

1976 And It Is Still That Way: Legends Told by Arizona Indian Children. Charles Scribner's Sons, New York.

A compilation of legends and stories as told by Hopi, Navajo, and other Arizona Indian children. For primary reading levels.

1969 Before You Came This Way. Dutton Publishers, New York.

A story about prehistoric Indian petroglyphs. For primary reading levels.

1972 When Clay Sings. Charles Scribner's Sons, New York.

A Native American perspective on prehistoric pottery designs. For primary reading levels.

1975 The Desert Is Theirs. Charles Scribner's Sons, New York.

A story about Indian desert people and nature. For primary reading levels.

1978 The Way to Start a Day. Charles Scribner's Sons, New York.

Celebration of morning by many cultures. For primary reading levels.

Bleeker, Sonia

1955 The Pueblo Indians: Farmers of the Rio Grande. William
Morrow & Company.

Good cultural study and history of the River Pueblos told through the point of view of a 12 year-old boy. Good for primary and intermediate levels.

Brown, Dee

1974 Wounded Knee: An Indian History of the American West.
Holt, Rinehart and Winston, New York.

Adapted for young readers from Bury My Heart at Wounded Knee. Good historical accounts of Indian/white relations in the 19th century. For intermediate reading levels.

Cork, Barbara and Struan Reid

1984 The Young Scientist Book of Archaeology. EDC Publishing,
Tulsa, OK.

Good overview of archaeological methods, mostly about classical sites in Europe. For primary and intermediate reading levels.

Fradin, Dennis B.

1983 A New True Book: Archaeology. Children's Press, Chicago.

A basic book about the methods and procedures used by archaeologists to study the past. For primary reading levels.

Freeman, Brian and Jody Freeman

1986 The Old Ones: A Children's Book about the Anasazi
Indians. The Think Shop, Inc. Albuquerque, NM.

Informative. A good discussion of lifeways. Good illustrations and photographs. Recommended for primary reading levels.

Goble, Paul

1989 Beyond the Ridge. Bradbury Press, New York.

A sensitive portrayal of the life and death of a loved one in a Plains Indian society. For all reading levels.

Goble, Paul and Dorothy Goble
1969 Red Hawk's Account of Custer's Last Battle. Pantheon
Books, New York.

An excellent account of Native American participation in the
Battle of the Little Bighorn. For primary reading levels.

Hobbs, Ida May
1987 The Coming of Grey Owl. Mesa Verde Museum Association,
Mesa Verde National Park, CO.

The story of a young Anasazi boy's life at Mesa Verde. For upper
primary grades.

Marriott, Alice
1960 The First Comers: Indians of America's Dawn. Longmans
Green, New York.

An introduction to North American prehistory with extensive
descriptions of how archaeologists do their work.

Macaulay, David
1979 Motel of the Mysteries. Houghton Mifflin, Boston, MA.

A humorous story about future archaeologists trying to figure out
who Americans were based on artifacts left over from a disaster
that wiped out most of human civilization. Written for adults,
but good for intermediate levels.

McGraw, Jessie Brewer
1981 Chief Red Horse Tells About Custer: The Battle of the
Little Bighorn. Elsevier/Nelson Books, New York.

An eyewitness account of the Battle of the Little Bighorn told
in Indian sign language. Might be useful for a classroom
project. For primary and intermediate reading levels.

Morrison, Velma Ford
1981 Going on a Dig. Dodd, Mead & Company, New York.

Excellent book about archaeological methods. Also includes
information about students who participated in excavations at the
Koster Site in Illinois. For intermediate reading levels.

Osinki, Alice

1987 A New True Book: The Navajo. Children's Press, Chicago.

Contains some contradictory information on the origin of the Navajo, otherwise a good cultural study of the historic and modern Navajo. For primary reading levels.

Palmer, William R.

1978 Why the North Star Stands Still and Other Indian Legends.
Zion Natural History Association, Springdale, UT.

A collection of Paiute Indian stories and legends retold by a white man who was granted permission to tell them. Recommended for children upper in primary grades.

Pickering, Robert B.

1987 I Can Be an Archaeologist. Children's Press, Chicago.

A basic book about what archaeologists do. Good for primary levels.

Red Hawk, Richard

1988 Grandfather's Story of Navajo Monsters. Sierra Oaks
Publishing Company, Sacramento, CA.

A collection of traditional Navajo monster stories. Recommended for children in primary reading levels.

Stuart, Gene S.

1979 Secrets form the Past. Books for World Explorers,
National Geographic Society, New York.

Good source of information for the student interested in archaeology. Workbook contains some good classroom activities. For intermediate reading levels.

Tomchek, Ann Heinrichs

1987 A New True Book: The Hopi. Children's Press, Chicago.

A good cultural study of the historic and modern Hopi. For primary reading levels.

Trimble, Stephen

1990 The Village of Blue Stone. Macmillan Publishing,
Company, New York.

Recreates one year in the life of an Anasazi community. Carefully researched, includes considerable information about culture and archaeology. Beautifully illustrated. Recommended for children in upper primary reading levels.

Uintah-Ouray Ute Tribe

1977 The Way It Was Told. University of Utah Printing
Service, Salt Lake City, UT.

Collection of Ute stories and mythology from various sources. For intermediate reading levels.

1977 The Ute People. University of Utah Printing Service,
Salt Lake City, UT.

Cultural history of the Ute people. For intermediate reading levels.

Yue, David and Charlotte Yue

1986 The Pueblo. Houghton Mifflin, Boston.

A summary of Anasazi and Pueblo lifeways including architectural development and cultural history. For primary reading levels.

AMERICAN INDIAN TRIBES

These listings are subject to change and are current as of August 1990. For updated information about specific Tribal contacts call:

The Division of Indian Affairs
324 South State, Suite 103
Salt Lake City, UT 84111
(801) 583-8808
John Powless, Director

Goshute Indian Tribe
(Confederate Tribes of Goshute Reservations)
Edmund Steele, Chairman
P.O. Box 6104
Ibapah, UT 84034
(801) 238-1138

Northwestern Band of Shoshone
Larry L. Neaman, Chairman
P.O. Box 145
Fort Hall, ID 83203
(208) 238-0916

Paiute Indian Tribe of Utah
Geneal Anderson, Chairman
600 North 100 East
Cedar City, UT 84720
(801) 586-1112

Skull Valley Goshute Tribe
P.O. Box 485
Grantsville, UT 84029
(801) 250-5911, ext. 2020 or
c/o Danny Quintana, Attorney
395 South 600 East, Suite 200
Salt Lake City, UT 84102
(801) 363-7726

Ute Indian Tribe
Luke Duncan, Chairman
P.O. Box 190
Fort Duchesne, UT 84026
(801) 722-5141

White Mesa Ute Council
Mary Jane Yazzie, Chairman
P.O. Box 340
Blanding, UT 84511
(801) 678-3397

Navajo Nation

Leonard Haskie, Interim Chairman

P.O. Box 308

Window Rock, AZ 86515

(602) 871-4941

AGENCIES AND ORGANIZATIONS

State Agencies

Division of State History
300 Rio Grande
Salt Lake City, UT 84101-1182
(801) 533-5755

Division of Indian Affairs
324 South State, Suite 103
Salt Lake City, UT 84111
(801) 538-8808

Division of Parks and Recreation
1636 West North Temple
Salt Lake City, UT 84116
(801) 538-7220

National Park Service

Arches and Canyonlands National Park
125 West 200 South
Moab, UT 84532
(801) 259 7164

Mesa Verde National Park
Mesa Verde, CO 81330
(303) 529-4461

Forest Service

Intermountain Regional Office
324 25th Street
Ogden, UT 84401
(801) 625-5172

Ashley, Uinta, Wasatch-Cache National Forests
125 South State Street
Room 8230, Federal Building
Salt lake City, UT 84138
(801) 524-6333

Dixie National Forest
P.O. Box 580
Cedar City, UT 84720
(801) 586-2421

Fishlake National Forest
115 East 900 North
Richfield, UT 84701
(801) 896-4491

Manti-LaSal National Forest
599 West Price River Drive
Price, UT 84501
(801) 637-2817

Bureau of Land Management

Utah State Office
324 South State Street
Salt Lake City, UT 84111
(801) 539-4066

Salt Lake District
2370 South 2300 West
Salt Lake City, UT 84119
(801) 977-4358

Cedar City District
176 East D.L. Sargent Drive
Cedar City, UT 84720
(801) 586-2401

Richfield District
150 East 900 North
Richfield UT, 84701
(801) 896-8221

Moab District
82 East Dogwood
P.O. Box 970
Moab, UT 84532
(801) 259-6111

Vernal District
170 South 500 East
Vernal, UT 84078
(801) 789-1362

Organizations

The Archaeological Conservancy

415 Orchard Drive
Santa Fe, NM 87501-9990
(505) 982-3278

The Archaeological Conservancy buys threatened sites and protects them from development and damage.

Utah Statewide Archaeological Society

c/o Antiquities Section
Utah Division of State History
300 Rio Grande
Salt Lake City, UT 84101
(801) 533-4563

USAS, an organization of avocational archaeologists, has nine local chapters in the state. Chapters each have a professional archaeologist as advisor, and are actively involved in a variety of field, research, and education programs. A three-level certification course is offered through USAS chapters. Chapters publish periodic newsletters and the statewide organization co-publishes Utah Archaeology with the Utah Professional Archaeological Council. Contact the state office at the Utah Division of State History for the chapter nearest you.

Utah State Historical Society

Dr. Kent Powell
Utah Division of State History
300 Rio Grande
Salt Lake City, UT 84101
(801) 533-5755

The USHS has several local chapters around the state. These chapters can provide assistance to teachers. Contact the Utah Division of State History for the chapter nearest you.

Utah Rock Art Association

Ray Daly, President
3890 West Lewis Port Dr.
West Jordan, UT 84084
(801) 966-7326

The purpose of the Utah Rock Art Association is to preserve rock art in Utah and educate the public about its value. Publishes a newsletter called Vestiges, sponsors an annual convention and symposia, and conducts field trips. Members will come to schools with prepared slide shows and presentations.

CORE CURRICULUM CORRELATION

Lesson	Social Studies	Science	Language Arts	Mathematics	Art
Unit 1, Lesson 1	6060-0104		4040-0106 4040-0201 4040-0302 4040-0304 4050-0307		
Unit 1, Lesson 2	6040-0201 6040-0202 6060-0301 6060-0303 6060-0604 6100-0201 6120-0201 6120-0202		4040-0602 4050-0502 4060-0502		
Unit 1, Lesson 3		3220-0101 3220-0105	4040-0201 4040-0206 4050-0204		
Unit 1, Lesson 4	6100-0105 6120-0105				
Unit 1, Lesson 5	6100-0105 6120-0105				
Unit 1, Lesson 6		3220-0105	4040-0602 4050-0502 4060-0502		
Unit 2, Lesson 1	6040-0201 6060-0202 6060-0303 6060-0604				

CORE CURRICULUM CORRELATION

Lesson	Social Studies	Science	Language Arts	Mathematics	Art
	6100-0201				
Unit 2, Lesson 2	6040-0201 6040-0202 6060-0303 6060-0604 6100-0201				
Unit 2, Lesson 3	6040-0201 6040-0202 6060-0303 6060-0604 6100-0201				
Unit 2, Lesson 4	6040-0201 6040-0202 6060-0303 6060-0604 6100-0201				
Unit 2, Lesson 5	6040-0201 6040-0202 6060-0303 6060-0604 6100-0201 6120-0201 6120-0307				
Unit 3, Lesson 1		3220-0101 3220-0105			
Unit 3, Lesson 2		3220-07 3060-0202			

CORE CURRICULUM CORRELATION

Lesson	Social Studies	Science	Language Arts	Mathematics	Art
Unit 3, Lesson 3	6040-0104	3200-01 3200-0104 3050-02			
Unit 3, Lesson 4	6040-0201 6040-0202 6060-0303 6060-0501 6060-0604 6100-0201 6120-0307	3060-0202 3050-02	4040-0602 4050-0502 4060-0502		
Unit 3, Lesson 5				5070-04 5070-0401 5080-03 5080-0301 5200-0601 5300-0601 5300-0702 5700-1003	
Unit 3, Lesson 6				5080-03 5080-0301 5080-0401 5080-0701 5080-0702 5200-0606 5200-0609 5200-0802 5700-0813 5700-0816 5700-1003 5700-1503 5700-1509	

CORE CURRICULUM CORRELATION

Lesson	Social Studies	Science	Language Arts	Mathematics	Art
Unit 3, Lesson 7	6040-0201 6040-0202 6060-0303 6060-0604 6100-0201 6120-0307		4040-0310 4040-0206 4050-0203 4050-0204 4050-0308		
Unit 3, Lesson 8	6040-0201 6040-0202 6060-0303 6060-0604 6100-0201 6100-0208 6120-0201		4040-0602 4050-0502 4060-0502		
Unit 3, Lesson 9	6040-0104				1040-01 1040-0107 1050-01 1050-0107 1060-01 1060-0114
Unit 3, Lesson 10	6040-0104 6060-0303 6100-0108		4040-0602 4050-0502 4060-0502		
Unit 3, Lesson 11	6040-0104 6050-0105 6100-0108 6120-0101 6120-0102		4040-0206 4040-0602 4050-0204 4050-0208 4050-0502 4060-0502		

CORE CURRICULUM CORRELATION

Lesson	Social Studies	Science	Language Arts	Mathematics	Art
Unit 3, Lesson 12		3220-01 3220-0104			
Unit 3, Lesson 13		3040-06 3060-0704 3220-01 3220-0105 3220-0404 3220-0702			
Unit 3, Lesson 14	6060-0501 6100-0105 6120-0105	3220-01 3220-0104	4040-0201 4040-0309 4040-0602 4040-0603 4050-0502 4060-0502		

